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ORIGINAL ARTICLES.

THE NATIONAL GOVERNMENT SHOULD HAVE SUPREME CONTROL OF QUARANTINE AT ALL FRONTIERS.

BY E. O. SHAKESPEARE, M.D.,
OF PHILADELPHIA, PA.

IN discussing the importance of "What the State Can Do to Prevent Cholera," the recent Surgeon-General of India, J. N. Cunningham, M.D., very justly states that "the questions involved are questions of vast interest, not only to the people of India, but to the people of all countries. They involve the health and happiness of millions of homes in all parts of the world."

We have only to recall the immense losses that have been entailed upon most of the civilized and uncivilized nations of the world through the invasions of this disease to appreciate the great practical value which the solution of this question may have.[1] In India, where cholera rages constantly from year to year, the Sanitary Reports of the Indian Government for the eleven years preceding and inclusive of 1884 show that, during that period, the deaths from cholera in that country amounted to not less than three and a quarter millions, in round numbers.

In referring to the ravages of the epidemics of cholera in Europe, it is not necessary to summarize the detailed losses that have occurred since the first visitation by cholera in 1831, but attention may be called in this connection to the extent of the damage done by the epidemic previous to the present one. In 1883, Egypt is said to have lost 60,000 lives from cholera, and it is estimated that in 1884 and 1885 Italy and France together lost in the neighborhood of 60,000 inhabitants from the disease; to these numbers should be added the loss that Italy suffered during the years 1886 and 1887 from the same cause. The loss of life in Austria-Hungary has also been considerable. Spain, however, was the greatest sufferer from the ravages of cholera during that epidemic. Among a population of 16,000,000 there were, according to the official reports (which, no doubt, are short of the reality), 119,620 deaths from cholera. The records of the present epidemic, so far as we learn, show that the mortality in Russia, in Persia, and in India has been quite as severe as in the worst epidemics that these countries have previously suffered. For example, we are informed that the loss to Russia alone from this cause in the present year has already amounted to 150,000 lives, and yet there is very little indication that the epidemic has passed its acme. Before the end of this season in that country, in all human probability, the deaths from cholera alone will mount to upward of 200,000. Judging from the history of previous epidemics in Russia, in all probability the next year will witness a sacrifice of even more lives than have been destroyed during the present season there.

When one undertakes to estimate the loss to a country of the intrinsic value only of the lives destroyed, the amount, though great, must seem insignificant when compared with the loss of incalculable millions of treasure due to the paralysis of industry and commerce. Political economists in Europe have variously estimated the value to the State of a human life. It may be said that the average estimate places this at one thousand dollars per capita. Calculating upon this factor, we see that a destruction of value in Europe, represented in human lives sacrificed during the epidemic previous to the present one, has amounted to two hundred and fifty millions of dollars. Estimating the value to the State of human life in India, which, let us say, is one-tenth of that amount—that is, one hundred dollars per capita—we find that India has suffered a loss from this source alone, during the eleven years mentioned, of three hundred and twenty-eight millions, five hundred and sixty thousand dollars. No doubt political economists in America would estimate the value to the State of the average human life as greater than the sum named per head, and if we regard the statistics of death by cholera in former epidemics in the United States, we can readily perceive the enormous national loss that has been due to this cause. So that when Surgeon-General Cunningham, in discussing the subject of what the State can do to prevent cholera, purely from the practical standpoint, and speaking of the theories at present entertained or that have been entertained at various times by scientific bodies concerning the nature of the disease, says, "Whether these theories are scientifically correct or not is a matter of very minor importance,"

[1] Much of the facts and language in this connection have appeared elsewhere; in the main, in my "Report on Cholera in Europe and India," published by the Government Printing Office, 1890.

he can scarcely expect that many familiar with the history of the ravages of cholera in parts of the world outside of Hindostan can agree with him.

In view of the enormous interest the State (that is, the Nation) has in the prevention of the injuries that follow the uninterrupted spread of a wide and devastating epidemic of any kind, and particularly of cholera, I propose to discuss from this standpoint the question of national supremacy in the control of quarantine at all frontiers.

In the first place, regarding the estimation of the loss by the State in the destruction of human life alone occasioned by cholera epidemics, it can be readily understood that the loss to the public occasioned by a single widespread epidemic of cholera, or even of yellow fever or smallpox, is far greater than would be the cost of the proper maintenance for many years of a perfect quarantine establishment at all our ports. In the case of Asiatic cholera especially, but also in that of scarlet fever or smallpox in a lesser degree only, the relation of the enormous emigration from Europe into this country, as bearing upon the introduction of epidemic diseases here and their rapid dissemination throughout the land, should be closely considered. It cannot be denied that the entrance of the thousands of emigrants who annually reach our country after starting from or passing through localities infected with contagious diseases, frequently in their persons and in their pestiferous clothing carry with them often as far as their ultimate destination, and let loose there the active germs of these diseases; and the herding of these emigrants into the miserably ventilated and frightfully unsanitary quarters usually provided for steerage passengers on the trans-Atlantic steamships, the modern rapidity of ocean and land travel, and the great facility with which these swarms of people are so soon distributed all over our country, combine to multiply the danger to the public health, with which, in the laxity of our laws and the unsatisfactory administration of them, these incessant influxes constantly menace the country.

In their enormous numbers, their poverty and their squalor, and in their mode of transportation of all sorts of infections and contagions, these emigrants can be likened only to the Oriental pilgrims, in whose track pestilence has so frequently followed. It is, indeed, with the extremest rarity that smallpox or cholera has, in modern times, been introduced into North America by any travellers other than the immigrant class. To take the proper means to guard the ports of entrance against the infected persons and baggage of cholera emigrants would probably keep cholera from our midst; to do the same with smallpox emigrants, with the addition of compulsory vaccination and disinfection of personal effects, as an invariable condition precedent to the privilege of landing, would go far toward banishing that scourge from the land; and the importation of scarlet fever, diphtheria, and like diseases might likewise be prevented by similar adequate measures. The past history of cholera and a study of the mode of its spread during the present epidemic (in which its movement from east to west has been unprecedentedly rapid) shows that the main conveyors of the infection have been, this year, as in all previous times, the persons and personal effects of emigrants, pilgrims, or large masses of soldiers.

In 1887, when cholera reached the quarantine station at New York, it was brought there by emigrants direct from the port of Naples, where cholera was then raging. The introduction into South America, in 1886, of the seeds of cholera, and the widespread epidemic in Argentina, in Chile, and in neighboring countries, was due to the conveyance of the infection by an emigrant ship that sailed from Genoa at a time when cholera was present in that locality. Although examples of the conveyance of cholera in this manner might be multiplied almost indefinitely, it is unnecessary to more fully emphasize the well-known and indisputable fact that it is by the unrestricted movements of such people during the prevalence of an epidemic of Asiatic cholera that the disease has been conveyed from one country to another.

The establishment of quarantine has heretofore been the main means relied upon to prevent the introduction into any country threatened by the invasion of the seeds of this disease—and with varying results, according to the favorable situation of the given country with regard to the course of these infecting streams, and according to the hygienic condition of the threatened populations. Because of the inadequate quarantine establishments, oftentimes combined with exceedingly faulty administration, in the past, these methods of preventing an introduction have often necessarily failed, and the failure has (irrationally, to my mind) been ascribed, almost universally, to an impossibility of warding off cholera in this manner. In fact, the history of past epidemics is prolific in examples of complete protection of localities and of whole countries, when absolute non-intercourse has been adopted. In modern times, however, the serious damage done to trade by the adoption of such a sweeping policy has brought about an almost entire repudiation of absolute non-intercourse as a means of prevention. To my mind, in the case of the United States, so far distant from the source of cholera, and so remote from European shores, we need only to fear, during the prevalence of a widespread epidemic of cholera in the northern portion of Europe, the introduction

of the disease here through the numerous hordes of emigrants constantly arriving from Europe.

It is a fact beyond dispute, that cholera preys upon and breeds among those living in squalor and filth, and closely follows their movement. It is exceptional, even in Bengal, the home of cholera, that the Englishmen there are attacked by the disease. It is true, also, in filthy and frightfully unsanitary localities in Southern and Eastern Europe, that the intelligent and well-to-do classes suffer to no great extent during the period of a cholera epidemic. There is but little danger of the class of people who constitute the cabin passengers of the trans-Atlantic steamers bringing with them, either on their persons or in their clothing, the infection of cholera. It is for this reason that I hold most confidently that the chief and, I may say, the *only* source of danger of cholera finding a foothold, when inspection is properly performed at quarantine, lies in its introduction by the emigrant classes.

The establishment of a policy of non-intercourse, so far as emigration is concerned, during the times when Europe is suffering from a cholera epidemic, would, in my opinion, constitute the best, and perhaps the only means of safeguarding the general public from the ravages of this disease. I have repeatedly had occasion, in several publications and in communications to the medical and lay press upon this subject from time to time, to point out the dangerous state of imperfection, to my personal knowledge known to exist, in several of the Atlantic quarantine stations. The ports of Boston, Philadelphia, and Baltimore would certainly, in their establishments and in their limited corps of administration, be unable to cope successfully, for any long period, with an invasion through the emigrant classes who are allowed to come incessantly during periods of prevalence of cholera in Europe to our shores. Even the quarantine station at New York—which is the best, most completely equipped and best administered of all our quarantine stations—with the frequent arrival of trans-Atlantic steamers carrying infected emigrants, would quickly reach the safety-point of defence and be overwhelmed, unless we adopt the policy of long detention of travellers, ships, and cargoes—a policy which would involve a tremendous loss to those engaged in maritime trade or in any manner associated in a business way, directly or indirectly, with maritime commerce. The capacity of the New York quarantine station will be reached for purposes of safe defence with the landing of, say, one thousand infected emigrants. It can be readily seen how soon, with an uninterrupted stream of emigrants from infected localities, the capacity of this, our best quarantine station, would be taxed to the utmost.

In my opinion, the action of the President in attempting to suspend immigration, even in the indirect manner of enforcing quarantine of twenty days, is a wise procedure, and perhaps the only one that could be adopted under the present circumstances which would reasonably insure this country against an invasion of cholera. The placing of an embargo on immigration *only* would undoubtedly be the most direct means of accomplishing this desirable result, and would not be coupled with any harassing impediments to the course of trade, involved in the long detention of ships and cargoes, or harassing restrictions upon the movements of travellers who are but little likely to introduce the infection. It is needless to point out that with the ship's inhabitants limited to the crew and the cabin passengers, certainly the quarantine station of New York, in its present preparation, could be safely relied upon to guard the country against the introduction of cholera through that port. The present arrangements that have been adopted and placed in operation at the quarantine stations of Boston, Philadelphia, and Baltimore—imperfect as these are in establishment—would also be in no danger of being overwhelmed by the exigencies of the occasion. I regret to learn by the public press, however, that, while the authorities at the three latter quarantine stations have willingly acquiesced in the determination of the President, as expressed by the proclamation of a twenty-days' quarantine against all vessels carrying European emigrants, the quarantine physician in control of the port of New York has allowed himself to be prompted by a spirit of defiance, in claiming his right, under the laws of the State of New York, to entire independence of any national control, thereby assuming to nullify the efforts of the General Government to protect the general welfare. It is unfortunate for the country that the quarantine officer at the port of our metropolis, through which the vast majority of European emigrants pass, to spread widely through the whole of our country, should so lightly regard the duties and relations of a frontier quarantine officer to the safeguard of the United States and the welfare of the sixty-five millions of her inhabitants.

This example in itself affords sufficient reason for the establishment, by national legislation, under Congressional laws, of the supremacy of the nation in control of quarantine at all our frontiers for the safeguarding of the *national welfare.*

The ridiculously antiquated, obsolete, and inadequate permanent establishments at most of our maritime quarantine stations, and the apparent impossibility, except perhaps when confronted with emergencies such as the present, of obtaining appropriations from local authorities of sufficient sums of money for the erection of extensive and com-

plete quarantine establishments in accordance with modern science and accurate knowledge of the nature, mode of spread and means of prevention of cholera, are further and, to my mind, incontrovertible reasons why the general public cannot rely upon independent local quarantines for the defence of the whole country against the introduction of the common epidemic diseases, much less of epidemics of cholera.

In this connection the question may be very pertinently asked: "Why, then, should the direction, expense, and responsibility of a system of common defence against the inroads of foreign diseases, any more than against invasions of foreign foes, be assumed and borne by those municipalities or States that happen to have a maritime location? Why should the vast majority located inland be allowed to shift their responsibilities and obligations or be denied a voice in the direction of affairs which so closely concern them? The protection of the public health by maritime quarantine is a matter that interests not merely a narrow belt of sea-coast; it seriously concerns the whole of the vast territory between our shores.

In view of the foregoing considerations I would therefore uphold the following propositions:

A. *The present methods of independent quarantine provided and regulated by sea-board States or cities are essentially defective and insufficient for the exclusion from the United States of the diseases against which quarantine is directed.*

The truth embodied in this statement is abundantly established by the report of the committee of the College of Physicians of Philadelphia, 1888, in regard to the three ports it inspected, New York, Philadelphia, and Baltimore, during the time of prevalence of cholera at the quarantine station of New York in the autumn of 1887. (Since the publication of this report, the quarantine station of the port of New York has been improved in one or two particulars—for example, a crematory has been put into active operation for the destruction of infective corpses; the large interiors of the two observation buildings on Hoffman Island have been divided into compartments for the better isolation of small groups of immigrants from infected steamers. This truth is fully borne out in regard to the other quarantine stations between the St. Lawrence River and the Rio Grande by the elaborate official report Dr. John H. Rauch, Secretary of the Illinois State Board of Health, made to that body in 1886, and the latest information shows that but little, if any, permanent improvements have been introduced in them.

The defects of local quarantine stations arrange themselves into two principal groups: (1) Inadequacy of establishment. (2) Faults of administration.

1. With regard to THE ESTABLISHMENT—which term is here used to include the accommodations for the temporary housing and care of immigrants and travellers not sick, adequate hospital accommodations for the sick, appliances for disinfection, and the necessary medical, nurse, police, and other attendants for the care of both of these groups of individuals—only four of the many stations upon the Atlantic and Gulf coast may lay claim to anything like adequate provision. These are Grosse Isle quarantine station on the St. Lawrence River below Quebec, the Boston quarantine station on Galop's Island, that in New York Harbor, and those in the Mississippi River below New Orleans.

Of these four it may be said: first, that the former excellent establishment at Grosse Isle is now dilapidated and practically useless as a safeguard against the importation of the disease, in view of the fact stated in the report of Dr. Rauch, that during the quarantine season up to October 9, 1885, only 32 vessels out of a total of 420 arrivals had stopped at this station for examination; second, that at the quarantine stations at Boston, Philadelphia, Baltimore, and I believe also New Orleans, no permanent provision for the housing and care of travellers and immigrants not sick exists; third, that in the last-named particular, as well as in several other respects, the quarantine station at New York, hitherto regarded as fully adequate to the requirements of that great port of entry, still shows defects. According to the official description by Dr. Joseph Holt, president of the State Board of Health of Louisiana, it would appear that the quarantine station at the mouth of the Mississippi is, in respect of means of disinfection, fully up to the requirements of modern science. Of the intervening stations it is scarcely necessary to speak. Certainly, as regards the prevention of cholera, and to a less extent also of yellow fever, the greater number of them constitute quarantine stations simply in name.

2. When we come to consider FAULTS OF ADMINISTRATION, it is obvious that it is impossible to discover their nature or extent during times of quarantine inactivity—that is to say, during those fortunately more or less prolonged periods in which the absence of disease upon incoming ships narrows the duties of the quarantine officials down to the simple inspection necessary to establish that fact at such times; we have therefore at present no criterion by which to judge of the efficiency of the quarantine administration at the greater number of the stations. The fact already mentioned with reference to the quarantine station at Grosse Isle, that during the quarantine season of 1885, up to October 9th, only 32 vessels out of the total 420 were examined, indicates defects in administration at that station so glaring as to require no further comment.

Faults of administration equally serious, although of a different kind, were shown by the above cited report of the committee already mentioned to have recently (1887) existed at the quarantine station in the lower bay of New York harbor at a time when cholera actually existed in the hospital, and was from day to day finding new victims among more than five hundred Italian immigrants detained at the quarantine of observation on Hoffman Island. It is only necessary to emphasize this statement by calling attention to the following facts brought to light by the investigations of that committee:

First, the absence of resident medical officers both at the hospital on Swinburne Island and at the quarantine of detention on Hoffman Island (this has been in the present emergency temporarily remedied); second, the absence of anything like an adequate sanitary police force on the latter island; third, the lack of any proper daily systematic inspection, such as would enab'e the authorities promptly to discover and isolate new cases of cholera—I mean the lack of direct subordinates of the quarantine officer constantly on board *all* detained vessels for the detection of looseness of the bowels—an exceedingly important matter in the case of cholera.

B. *It is impossible adequately to protect the public health of the country against the importation of epidemic diseases by independent local maritime quarantine establishments.*

Rival political and commercial interests are inimical to the perfect protection of the general public of the whole United States by independent and local quarantines.

One of the most serious dangers to which the general public is exposed through local maritime quarantine organizations is the possibility of bodies of immigrants with infected baggage being transferred directly from the quarantine station to distant inland communities by rapid railroad journeys, without any prolonged sojourn or without any adequate inspection at, or precautions being taken by the authorities of the seaboard cities through which they pass. In point of fact, this danger was realized in regard to cholera in 1873, when epidemic outbreaks of that disease occurred in Ohio, Minnesota, and Dakota, which were "caused by cholera poison packed up in the household effects of emigrants from Holland, Sweden, and Russia, respectively. *These emigrants sailed from healthy ports in healthy vessels, and were subjected to the usual sanitary requirements of the period. They passed through New York and the intermediate territory without injury to the public health; but when their infected goods were unpacked in the interior of the continent they liberated the poison which gave rise to the local outbreaks.*" (Report of Dr. Rauch.)

It is but natural that municipal organizations should, in looking after their own interests, pay little regard to the welfare of distant communities.

In this connection may be noted the indisposition and failure on the part of local quarantine officers to notify the authorities interested, of the arrival of emigrants from infected localities. Notwithstanding the frequent paramount interest of inland communities in the efficiency of the establishment and administration of quarantine at the seaboard, the local authorities of the latter frequently evince an unreasonable jealousy of any sort of investigation or suggestion looking to the general welfare.

In the absence of any general regulation or supervision, local quarantine measures must in the nature of things be exercised with varying degrees of efficiency; the most complete establishment and perfect administration at a few ports might, therefore, fail to protect the country if defective or inadequate measures of quarantine were practised elsewhere.

C.—*National supremacy of maritime quarantine is necessary.*

1. It is only in this way that the necessary protection against the importation of epidemic diseases in all our ports can be continuously secured.

2. It is the only practical mode by which uniformity of establishment and administration, regard being had to the modifications made necessary by difference of latitude and other circumstances, can be assured. Such necessary uniformity can be obtained by no other arrangement, for the reason that the National Government is alone able to defray the expense of complete quarantine establishments at every port, according to the requirements of each and without regard to the revenue derived from the shipping of any.

3. The benefits of quarantine inure to the welfare of the whole country; therefore, it is just that money should be as freely expended when necessary at one port as at another, without respect to their relative commercial importance or to the amount of revenue collected in the shape of boarding and inspection fees, etc. It is manifestly unfair that the seaboard cities and States should, as at present, be obliged to bear the entire expense of quarantine establishments whose most important function should be the protection of the inhabitants of every region of the vast territory of the United States.

4. A national quarantine, properly administered and conducted by trained officials, accustomed to deal with contagious and infectious diseases, would tend to prevent panic, to allay undue anxiety, and to favor a reasonable sense of security.

5. Experience has shown that much needless alarm, as well as preventable danger, arises upon the appearance of an unfamiliar epidemic disease

at quarantine stations, as when cholera has shown itself at New Orleans or New York, or yellow fever at Philadelphia or Boston. A national quarantine would very greatly lessen the necessity for vexatious temporary interstate quarantines, which so seriously disturb inland trade.

6. A national quarantine system, directed in such a manner as to fully meet the requirements of existing sanitary knowledge, would not adversely disturb any commercial interest. It would, on the contrary, do away with many of the embarrassments incident to maladministration of existing local regulations, and the enforcement of measures which are unnecessary and are prompted by a state of panic due to ignorance of the best and most reliable methods of prevention.

7. A national quarantine would not necessarily supersede any existing arrangements regarded as expedient by local authorities. It should constitute an outer line of defence under exclusive control of the National Government, and it should be conducted wholly without extra cost to shipping, and would thus work no additional pecuniary hardship, even if the present fees were to be still exacted by the local authorities.

8. The ability of the National Government by an existing Act of Congress to come to the aid of local quarantine authorities in answer to the appeal of the Executive of any State in time of grave danger implies a function of very narrow scope and uncertain application. Appeals of this kind are likely to be deferred until the emergency is extreme, and the aid obtained from the Government is therefore likely to be rendered too late to accomplish its most important purpose, namely, the prevention of an invasion.

D. *A national organization would secure advantages not attainable by independent local quarantine establishments, however complete.*

Among many other advantages the following may be enumerated:

1. Suitably arranged and commodious buildings provided with necessary furniture and appliances at all ports.

2. An efficient corps of trained officials and assistants always on duty.

3. The practicability of the concentration of force, money, and attention at any threatened port without loss of time.

4. Officials under the control of the National Government and free from local political and commercial influence.

5. The objects of quarantine would be furthered by full and reliable consular reports and sanitary inspection of emigrants at ports of embarkation, functions properly belonging to officials of the General Government.

The organization of a supreme national maritime quarantine system in the United States should require:

1. That the whole matter should be placed under an appropriate department of the General Government.

2. A central bureau of control established at Washington.

3. A sufficient corps of medical officers and assistants, with nurses, sanitary police, laundrymen, engineers, and officers and crews for boarding tugs, organized at every station. *Among the requirements for the medical service should be a speaking knowledge of at least two modern European languages besides English.* In view of the constant and systematic attempts to falsify the ship's log for the purpose of concealing the existence of infectious disease during the voyage, the health officers should be able when necessary to go among the passengers and *themselves* closely question them, without the mediation of an interpreter. The establishment of a school and laboratories for sanitary instruction and research in connection with this service would be an advantage. In addition to the men on duty at the respective stations, there should be a sufficient number of medical and other officials fully trained in quarantine duties and familiar with contagious diseases, unattached and available for immediate auxiliary service at any threatened port.

4. The erection of necessary hospital and othe buildings, wharves, disinfecting apparatus, washhouses, latrines, etc., in suitable localities, when possible upon islands at or near the entrances to harbors, and at some distance from the main channel.

5. These stations must be organized and fully equipped at every port of entry of the coast in such a way as to meet the requirements of each port in the measure of its commerce and immigration and the especial diseases to which it is most exposed.

6. The cost of the establishment and maintenance of the national maritime quarantine should be provided for by appropriation from the National Treasury, and not from fees exacted from vessels.

The danger from immigrants would not be entirely banished, however, though the quarantine of the coast of the United States were perfect, for the way through the British Provinces would still be open to these travellers. In the absence of efficient quarantine inspection in the St. Lawrence River and in Nova Scotia, the attempt thoroughly to protect ourselves from importations of epidemics would necessitate the doubtful and difficult expedient of a land quarantine along our northern frontier. The more efficient plan would be to have the same precautions taken at the ports in the British provinces as should be practised at those in the United States; but this course could only be assured through treaty

or international agreement, which our local authorities are not competent to make.

It appears that our Canadian neighbors have already evinced their desire for uniform quarantine laws for the two Governments. The Provincial Board of Health of Montreal, recognizing a community of interest in the question of maritime quarantine, deemed the presence of the Canadian Fish Commissioners in Washington opportune for the adoption of resolutions requesting the Commissioners to urge upon the American authorities "the necessity of establishing uniform quarantine regulations for both countries." In connection with an efficient system of national quarantine a harmony in the provisions of law in the United States and in Canada seems indispensable for the full protection of our extensive northern frontier, and our National Government should be strongly urged to respond actively to the expressed wishes of the Canadian authorities relating to such an important matter of common interest.

PROPHYLACTIC MEASURES AGAINST ASIATIC CHOLERA.

BY A. C. ABBOTT, M.D.,
FIRST ASSISTANT, LABORATORY OF HYGIENE, UNIVERSITY OF PENNSYLVANIA.

WITH the existence of Asiatic cholera in the western seaports of Europe, the question involving its possible importation into this country becomes a grave one, and it behooves us to exercise the greatest vigilance in endeavoring to prevent such a calamity.

There is no doubt that the suggestion, radical though it is, that has recently been made to the President of the United States by the Medical Board of the Johns Hopkins Hospital, at Baltimore, viz., that immigration be entirely interrupted until after the disappearance of cholera from the western cities of Europe, is by far the safest measure that could be employed. It is practically impossible, by the means ordinarily employed, to disinfect and render harmless every article from an infected ship; and, unless this is done, there can be no assurance that the disease will not be introduced, through articles contaminated with the disease-producing element, into localities to which such articles are carried.

Should it not be considered wise to check absolutely all immigration into the United States until after the disappearance of the disease from the infected ports of Europe, there remains to be considered the question of quarantine. Quarantine, if maintained for a sufficiently long period, offers a certain guarantee of safety against the spread of the disease through the bodies of individuals who come from the plague-stricken districts; for they are usually detained for a length of time sufficient to permit of the appearance of the disease had the causative elements gained entrance into their bodies; but, as is most commonly the case, the means employed for disinfecting the personal effects of these individuals that arrive along with them on the same ship are of but little value; and it is through the channel afforded by soiled and infected bedding, clothing, etc., that the greatest danger is to be anticipated.

Another point that is worthy of consideration in connection with the subject of quarantine and of absolute cessation of immigration is whether or not it would avail us much without the institution of similar measures by our neighbor, the Dominion of Canada, into whose eastern seaports immigrants are constantly arriving from the same places as those from which come the immigrants against whom we are taking such radical steps. With Canada separated geographically from the United States by only an imaginary line, it must be plain that it would be practically folly for either country to close its doors against the tide of immigration without similar steps on the part of the other; for, unless they act in unison, the tide will simply be deflected from the closed to the open way, and, related geographically as both are, the existence of cholera in either place would be a menacing danger, if not a practical assurance, of its appearance in the other.

As yet, thanks to the vigilance of the health officials along the Eastern seacoast, there has been no appearance of the disease among us, but in anticipation of such a visitation it might be wise to consider the measures that are known to be most effectual in checking its spread.

Of primary importance in the management of cases of cholera, is of course an accurate diagnosis of the condition; and fortunately this offers but little difficulty to the skilled clinician, particularly if it has been his privilege to have seen the disease before, and still more especially if it is in his power to bring bacteriologic methods to his aid.

When recognized, the management of these cases and the methods of prophylaxis against their spread depend so largely upon absolute isolation and attention to sanitary surroundings that too much stress cannot be laid upon these points.

By isolation is not meant simply the confinement of a patient in a room or apartment set aside for infectious maladies, but it comprises a great deal more: it must be absolute, or the sense of security that it affords becomes false, and is, therefore, worse than useless. The isolation of a patient with this disease or with any other form of highly infectious malady implies the provision of separate apartments; an attendant whose duties are confined to patients who are similarly affected; plates, dishes, bed-pans, bed-clothing, etc., that are used by no other patient;

and a rigorous disinfection of all excreta, vomited matters, and refuse food *before they are removed from the apartment occupied by the individual.* It involves the greatest care and intelligence on the part of the attendant, to close all channels through which he or she and the patient may become a source of contamination, for contamination and spread of these diseases occur almost as frequently through the attendant as through the patient. The reason for this can be appreciated only after an intimate acquaintance with the nature of the causative element and its peculiarities when outside the body of the diseased individual.

Studies that have been made upon Asiatic cholera in recent years have shown it to be of an infectious nature and due to the activities of a specific lower organism which is present in the intestinal canal of all infected persons. This organism belongs to the family of bacteria. It is a bacillus, comma-shaped or curved in its morphology, and presents peculiarities of growth and chemical reactions that render its identification by the bacteriologist a matter of certainty and of a fair degree of simplicity. As a result of studies upon the nature of this organism, when isolated under artificial conditions, it is found to possess a relatively low degree of resistance to both thermal and chemical agents—that is to say, its vitality and disease-producing properties are easily destroyed by heat, and it quickly becomes inert when subjected to those chemical substances that are known to possess germicidal qualities. It likewise loses its resistance when *absolutely* dried, but retains it for a longer or shorter time when the drying is not complete. Having gained access to water, its growth seems to depend upon the amount of organic matter present, the reaction of the fluid, and also upon the number and kinds of other organisms that may be present, for, owing to the antagonism that is seen to exist between different species of bacteria, it not uncommonly occurs that one species or group may develop entirely at the expense of the other, which quickly disappears.

Milk offers a most favorable nidus for its growth, as do likewise many solid materials used as food-stuffs, and particularly after they have been cooked. The bacillus is very sensitive to both acids and alkalies, and is quickly killed when subjected to the influence of either. As has been stated, it is located in the intestinal tract of the affected individual, and therefore appears in enormous numbers in the intestinal evacuations from these patients; and it is through these evacuations that the disease is usually disseminated.

Some of the more common channels through which diseases of this class are transmitted are drinking-water, milk, and solid food-stuffs that are eaten in an uncooked condition, such as salads, fruits, etc.

Bearing in mind the points that have been here hastily reviewed, it is easy to comprehend the value of measures that will now be suggested for prophylaxis against the disease.

During the existence of an epidemic of Asiatic cholera—

1. No food, of whatever character, should be eaten in an uncooked condition.

2. All water intended for drinking purposes should be heated to a temperature of 80° C. (176° F.) for half an hour, or boiled for ten minutes and allowed to cool before using. When iced, the ice should be placed around the vessel containing the water, and not in it, as ice may contain organisms that have not been rendered incapable of development by the low temperature to which they had been subjected.

3. Milk should be steamed in a vessel placed within an ordinary kitchen steamer (if a regular sterilizer is not at hand) for fifteen minutes, and allowed to cool before using. The same precaution as regards icing is to be taken as was recommended for water. A somewhat lower temperature may be employed if care be taken that it does not fall below 80° C. (176° F.), for half an hour. This method requires a little more care, but causes less alteration of the milk than that following the application of a higher temperature. If the milk is to be kept for any length of time after heating, it is better to heat it in clean bottles plugged with cotton-wool. These bottles are placed in the steamer and heated for the proper length of time. They are then removed, kept in a cool place, and their plugs not removed until the milk is to be used.

4. Salads of uncooked materials are to be dispensed with, and all vegetables, fruits, etc., particularly those coming from districts in which "night-soil" is employed as fertilizer, are to be thoroughly boiled or otherwise cooked before using.

5. If possible, a daily bath in warm water, with the use of soap, should be indulged in, and the teeth should be carefully brushed after each meal. In short, rigorous attention to personal hygiene is of greatest importance.

6. In the management of cases of Asiatic cholera, isolation should be as complete as possible. Wherever practicable, tents on open lots, lawns, or fields are perhaps the best shelter for the sick. These patients should be provided with special nurses, who are made thoroughly aware of the fact that they themselves afford as potent a channel for the dissemination of the disease as do the patients themselves. These nurses should come in contact with no one other than the patient and physician. They should be impressed with the necessity of rigorous attention to their personal hygiene, frequent baths and changes of clothing being all-important. The

nurse should under no circumstances partake of food in the apartment occupied by the patient, and never partake of any portion of the food remaining from the meals of the latter. Before meals her hands should be scrubbed with soap, brush, and hot water, and after drying be rinsed off in 1:1000 solution of corrosive sublimate and dried.

7. The evacuations and vomited matters of the patient should be disinfected *as soon as passed and before they are removed from the apartment.* This is best accomplished by thoroughly mixing them with ordinary milk of lime (fluid "whitewash") until the mass is of a *distinctly alkaline reaction.* They should remain in contact with the lime for from twenty to thirty minutes. After this they can with safety be emptied into the general receptacle for such matter.

8. Bed-pans, bed-clothes, etc., that have been soiled by the evacuations of the patient must be cleansed by boiling for from *twenty to thirty minutes* in water to which about 1 per cent. of common soda has been added.

9. Mattresses should be subjected to sterilization in a *steam sterilizer for one hour.* If this is impossible, they should be burned. It is difficult to render harmless such large objects without injury to them, and unless the facilities are perfect these objects should be completely burned.

10. All clothing, towels, and napkins from the patient should be placed in clean canvas bags and conveyed from the apartment. At a proper place, arranged for the purpose, they should, without being removed from the bags, be sterilized in a steam sterilizer at 100° C. (212° F.) for one hour. They can then be removed and washed with safety. If it is not possible to employ steam they can be packed in an ordinary wash-boiler and boiled for half an hour in water to which 1 per cent. of common soda has been added. Care should be taken that each article is thoroughly soaked by the water during the boiling.

11. All dishes, knives, forks, spoons, etc., used by the patient should, after each meal, be boiled in 1 per cent. soda-water for half an hour.

12. The remains of meals should be thrown into a vessel containing milk of lime. At the end of each day, the vessel should be emptied into the general receptacle for feces, etc., and refilled with the milk of lime for the next day's use.

13. If practicable, the patient should be bathed as often as circumstances will permit, and the nates, thighs, and anus thoroughly cleansed with soap and water.

Before closing, emphasis will again be laid upon the necessity of *isolation* in the sense laid down in the foregoing directions: Separate attendants, who do not come in contact with other attendants whose duties take them to patients sick of other diseases; special clothes, bed-clothes, dishes, knives, forks, spoons, napkins, towels, etc., for each patient, and a careful disinfection of the same as soon as they have been used, and are ready to be removed; disinfection of excreta with milk of lime *at the bedside, or before removal from the apartment.*

After the death or removal from the apartment of the patient, the walls should be wiped down with moist cloths, sponges, or fresh bread-crumbs. These are to be burned as soon as used. Floors should be scrubbed with ordinary soap after having been *saturated* with a solution of 1 : 1000 corrosive sublimate. Furniture should be thoroughly wiped with cloths soaked in 1 : 1000 corrosive sublimate solution. All cotton or woollen materials in the room should be either steamed or boiled, according to the rules already given for bedding, clothing, etc. The room should then be thrown open to air and sunlight for several days.

In the event of death, the body should, without being washed, be immediately wrapped in sheets, placed in a coffin, and buried or cremated as quickly as possible. If buried, it should be placed beneath the surface at a depth of not less than six feet, and not in the near vicinity of a spring or watercourse.

There is absolutely no objection to burying the bodies, providing the interment does not take place in a locality where a spring or watercourse could be directly contaminated; indeed, on the contrary, experiment has demonstrated that this method of disposing of infected materials is second to cremation only in its requiring a somewhat longer time for the accomplishment of the same end.

The foregoing directions comprise those sanitary measures that have been found by experience to afford the greatest protection against the contraction and spread of infectious diseases generally, and particularly of that class of diseases of which Asiatic cholera is a representative.

NOTE.—In times of epidemic, the most common prophylactic measure is, perhaps, fumigation by means of sulphurous acid. This is usually accomplished by burning sulphur in the infected room. In order to carry out this measure with any degree of certainty that it is doing what one desires, a great deal of care and detail is necessary, and for that reason it is not a measure to be recommended for general use. By the ordinary means that are employed in fumigation, practically nothing of good is accomplished. It is, however, possible to disinfect apartments by this means if they are closed as tightly as possible, by pasting paper over the cracks about the doors and windows, and burning not less than from a pound to a pound and a half of sulphur for every 1000 cubic feet of space to be disinfected. Even then the best results are obtained only with

the simultaneous generation of steam in the apartment, or by previously having moistened every crack and crevice in the wall, ceiling, and floor with water. The reason for this is that sulphurous-acid gas in a dry state or upon dry objects has but little germicidal value; this property is only developed in the presence of moisture.

NOTES ON THE DIAGNOSIS AND TREATMENT OF CHOLERA.

BY WILLIAM OSLER, M.D.,
PROFESSOR OF MEDICINE, JOHNS HOPKINS UNIVERSITY, BALTIMORE.

THE welfare of an entire community may depend on the early recognition of the nature of the disease. With an outbreak at our doors, so to speak, the physician will scrutinize sharply all dubious cases, and in a natural anxiety to protect the patient and his family from trouble and inconvenience, will remember also the larger obligation to do all in his power to prevent the spread of one of the most formidable of human scourges.

The diagnosis of Asiatic cholera, easy and clear during the prevalence of an epidemic, may be at its outset (and under certain circumstances) exceedingly difficult. The clinical features of the disease and the bacteriologic examination of the stools furnish the data upon which to base an opinion.

A. *The clinical picture.* Here we are at once confronted with the lack of symptoms distinctive of, and peculiar to, the disease. A case of cholera nostras (morbus) may present every feature of the imported malady; and though it rarely kills with the same rapidity, yet I have known death to follow in an adult within fourteen hours. The preliminary diarrhea, the vomiting, the copious serous discharges, the collapse, and cyanosis offer no differential criteria.

It is only, however, during "cholera times" that this difficulty becomes serious; and then during the summer months, if the number of cases increases rapidly, it may tax all the resources of our art to reach a positive conclusion. The recent experience in Paris is, in this respect, most instructive. Throughout the months of May, June, and July, an epidemic of choleraic diarrhea broke out in certain of the suburbs that received polluted Seine water, and more than four hundred deaths occurred. The disease, which was called cholera nostras, choleriform diarrhea, and cholerine, in many instances killed within a few hours and had all the clinical characters of the Asiatic form; but the persistence in certain localities, without rapid extension, and the freedom of the city proper, encouraged the hope that it was due to intrinsic and not to extrinsic causes.

Dupuy's interesting report from the Hôpital St. Denis describes a disease of abrupt onset, a rapid course, and of great fatality, thirty-one deaths occurring in sixty-five cases. There seems to have been a disposition on the part of the authorities to conceal the serious nature of the epidemic—partly, no doubt, in consequence of the absence at first of positive bacteriologic information, and partly owing to the difficulty in obtaining uniformity in the opinion of the physicians, some declaring it to be true cholera, others that it was only a somewhat widespread endemic of cholera nostras.

Since, then, it must be acknowledged that in individual cases and even in local outbreaks, it may not only be difficult, but even impossible to distinguish clinically the two affections, the physician should, from the outset (particularly at the present juncture, when an outbreak may occur), take precautions as if dealing with true cholera, especially in carrying out disinfection of the stools.

It is of the greatest importance to see cases early, before the symptoms of collapse appear, and people should be instructed to seek advice on the first indication of gastro-intestinal disorder. Dyspeptic conditions and diarrhea, often premonitory symptoms, give timely warning in many instances, but by no means in all, for an individual may go to bed feeling quite comfortable and awaken during the night with cramps, vomiting, and diarrhea.

It is scarcely necessary to refer to the attacks simulating cholera produced by arsenic, corrosive sublimate, and certain fungi.

B. *Bacteriologic examination.* This is of the first importance, and should be carried out by experts who have critical familiarity with the complex flora of the intestines. Though there are difficulties, the differentiation of the comma-bacillus of Asiatic cholera can be made, and has been made in the recent outbreaks in Paris by Netter, Chantemesse, and Roux. In all doubtful cases, measures of isolation and disinfection should first be used, and then a thorough examination carried out to determine the presence or absence of the comma-bacillus.

It seems almost an abuse of terms to speak of the *treatment* of a disease of which the mortality is at least 50 per cent.; but although measures are futile in the more malignant cases, there can be no question that prompt action may arrest progress in the less severe forms, while we have at our command the means of alleviating many of the most distressing symptoms.

The experiments of Haffkine encourage the hope that protective inoculation may yet reach a satisfactory position and be more worthy of confidence than the vaccination of Ferran, but we have no ready method at present available. The ideal treatment would be found in a remedy that, given early,

would either control the multiplication of the bacilli in the bowels or neutralize the action of their poisonous products. Several drugs have been recommended for this purpose—salol, particularly on experimental grounds, by Loewenthal; and reports from various sources speak of good results. The drug may be given freely, in doses of from gr. xv to xxx every hour at first, for four or five hours, and subsequently every three hours. It probably acts by retarding the growth of the organism. There is no known remedy that is directly antidotal to the cholera poison. Brunton has advised atropine, to counteract the supposed contraction of the pulmonary arterioles, regarded by Sir George Johnson as the cause of the cyanosis.

The symptomatic treatment should be directed to—

a. Relieving the collapse by hot stimulants, as tea, coffee, brandy, and the external application of heat in various ways. The hot bath should be tried.

b. Checking the vomiting. Cracked ice and champagne, creasote, hydrocyanic acid, menthol, and other means may be tried.

c. Checking the diarrhea. There can be no question that the collapse is directly due to the diarrhea, and yet it is probably an effort of Nature to get rid of the poison. Indeed, an evacuant treatment has been urged by Johnson, who advises the use of castor-oil; but the general opinion runs strongly in favor of the use of remedies to check the profuse discharges. Various combinations of opium and ether are employed, with or without astringents. Morphine, hypodermatically, is of the greatest value for this purpose, and is to be preferred to opium by the mouth if the vomiting is obstinate. It has the advantage also of quickly relieving the pains and allaying the terrible restlessness. Lactic acid has been strongly recommended by French physicians.

Two special measures may be given a thorough trial, viz.: *hypodermatoclysis* and *enteroclysis*. The former Cantani urges upon the following grounds:

"1. The death of cholera patients supervenes either by asphyxia in the algid period or in consequence of a tumultuous reaction in the typhoid stage, because the organism, through diarrhea and vomiting, has lost a very large quantity of its aqueous constituents, and has retained or cannot longer eliminate the excrementitious materials—the products of combustion and decay—on account of suppression of the functions of the kidneys.

"2. Recovery occurs when absorption is resumed, in the intestinal canal, of the fluids which furnish to the blood and to the tissues the water which is indispensable to them."

The formula which he advises is as follows:

℞.—Sodium chloride . . .	80 grams.
Sodium carbonate . . .	6 "
Boiling water . . .	2 liters.

With a fountain-syringe and the canula of an aspirator, from one to two liters of the fluid is allowed to flow gently beneath the skin of the flanks. The tumor formed by the fluid is slowly rubbed away. He advises the warm bath in conjunction with the infusion. The operation may be repeated in two or three hours.

Enteroclysis is even more warmly recommended by Cantani, a mixture of laudanum and tannic acid being employed. The following is the procedure: "If a slight attack of a seemingly simple diarrhea does not yield at once to rest in bed and the administration of a dose or two of warm infusion of chamomile, to which chlorodyne or laudanum has been added in proper quantity, then recourse should be had, without loss of time, to the warm enteroclysis of tannic acid. This enteroclysis is essentially an injection into the colon, per rectum, of a considerable quantity of warm water holding in solution a certain percentage of tannin. The rectal syringe, by means of which the injection is made, is furnished with an elastic tube three meters in length, with a nozzle at the free extremity and a cock at the proximal end. With such an instrument not only the whole length of the colon can be filled with the desired fluid, but also not infrequently a quantity can be made to pass beyond the ileo-cecal valve into the small intestine.

"The tannic solution recommended by Cantani is constituted for an adult as follows:

"℞.—Boiled water or infusion of chamomile, warm	2 liters.
Tannin . . .	5 to 10 grams.
Laudanum . . .	30 to 50 drops.
Powdered gum arabic .	50 grams.

"The temperature of the mixture and the quantity to be injected should vary according to the age of the patient and other circumstances, in the judgment of the physician. The most convenient time for administration of an enteroclysis is immediately following an evacuation." (Shakespeare.)

BRIEF SUGGESTIONS AS TO THE PREVENTION, RECOGNITION, AND TREATMENT OF CHOLERA.

BY ROLAND G. CURTIN,
OF PHILADELPHIA.

IN view of the probable visitation of the Asiatic scourge, it may not be amiss, at this time, to call attention to some of the more practical features of the disease.

First, as to *prophylaxis*. The prevention is better than the cure. After the germ has obtained a foot-

hold, what is the proper course to pursue to guard against the disease?

The first important step is to keep the body and its surroundings perfectly clean. The body should be frequently bathed and the clothing changed. See that all cellars are free from contaminating substances, and all privies and gutters properly disinfected. Avoid crowding, as this favors the propagation of the disease. Eat moderately of good, nutritious food (don't starve yourself). Avoid fatigue, exposure, intemperance, and all excesses or anything that has a tendency to depress the vital energies. Take a full amount of sleep at regular intervals. Regularity and temperance in all things are of the utmost importance.

All drinking-water and milk should be boiled—this being especially important in Philadelphia, owing to the danger of the water being contaminated in its passage through the Schuylkill valley above the city. Avoidance of all saline laxatives i is a safe rule during an epidemic.

I will quote from an article of mine entitled "Sulphuric Acid as a Prophylactic in Cholera," published in the *Philadelphia Medical Times*, July 12, 1873:

During this last visitation (1866–67) I was resident-physician in the Insane Department of the Philadelphia Hospital. The disease had almost entirely disappeared from the city and from all parts of the Philadelphia Almshouse and Hospital, except from the women's wards in the insane department, where it still continued in a very virulent form. Strange to say, it was almost entirely confined to three of the seven wards on the female side of the hospital. It was so persistent that the Board of Health paid the hospital an official visit, but were unable to account for the presence of the disease in particular wards. It is true that the women's apartments were very much crowded, there being three hundred and fifty inmates, but the wards in which it was so prevalent had proportionately fewer inmates than others which almost entirely escaped. During the whole epidemic only two cases occured in the male wards, while among the females one in every nine was attacked. Sex would not account for this difference, for statistics at large show that male and female lunatics are equally liable to the disease.

After having concluded to use sulphuric acid, the next thing was to administer it to all the patients, many of whom were so suspicious that they refused at all times to take medicine, for fear of being poisoned. Knowing that it would be impossible to conceal it in their food or usual drinks, I concluded to administer it disguised as lemonade, and announced through the nurses to the patients that I intended to "treat" the whole institution to lemonade every day, which announcement was well received in general, and by some of them with enthusiasm. The drink was made in this way. About twenty drops of the dilute sulphuric acid were mixed with four ounces of water and sweetened with white sugar. Some oil of lemon and a few cut lemons greatly assisted in the disguise. What followed the administration of the sulphuric acid can best be shown by the notes taken at the time. The diary was begun on August 20, 1866, before which time seventeen cases had occurred in the insane department.

August 20.—Four new cases.

August 21.—Four new cases.

August 22.—Four new cases.

August 23.—Two new cases. Board of Health visited the hospital.

August 24.—Five new cases.

August 25.—One new case. Acid given for the first time, in the afternoon.

August 26.—Four new cases *during the early morning hours* within twelve hours after the first administration of the acid.

August 27.—No new cases.

August 28.—One new case—a woman who refused to take the acid.

August 29.—No new cases.

August 30.—No new cases.

August 31.—No new cases. The acid was discontinued.

September 1.—No new cases.

September 2.—Two new cases—two days after the suspension of the acid.

September 3.—No new cases. Acid resumed.

The acid was continued for some time, and no more cases occurred.

It will be seen by the above diary that up to the time of administering sulphuric acid the disease was pursuing a steady course in the female department. It is true, and should be here stated, that every means had been tried to banish the disease, such as ventilating and cleansing the wards, spreading disinfectants, scattering the patients by using a large sewing-room for a sleeping ward, attention to diet, etc., but without apparent effect. The acid was first given on the 25th of August and continued until the 31st. Four cases occurred *within twelve hours* of the time when the acid was first given. After this only one case occurred while the acid was being used, viz., on the 28th. This was a poor ignorant (?) lunatic, who, upon tasting it, spit it out, and surprised me very much by saying, with great vehemence, "Doc-ther, ye call this limonade; but ye can't desave me; it's nothing but ile of vitriol." On the 31st of August it will be seen that the "lemonade" was stopped, on account of the exhaustion of the supply of white sugar in the drug store, as without this sugar it would have been impossible to prepare the acid in such a manner as to insure the patients' taking it. On the 2d of September, *two days after the suspension of the use of the acid, two new cases occurred*, both of which proved fatal. The prophylactic was then resumed, and *no new cases* afterwards occurred in the insane department; but cases continued to arrive from the city until the 1st of November. The use of the acid was continued uninterruptedly for several weeks. My friend Dr. J. F. Wilson gave it to the patients in the surgical wards during the epidemic, and he informs me that *cholera visited every department of the almshouse and hospital except the surgical wards.*

The question naturally arises, was it the sulphuric acid that arrested the march of the disease? I think it was, for the following reasons:

1. *The prompt disappearance of the disease within twelve hours of the time when the acid was first administered*, the only case arising during its use being that of a patient who refused to receive it. The acid was stopped on the 31st of August, and two days after this two cases occurred. The acid was then immediately resumed, and not a single case occurred afterwards.

2. *The fatality attending the disease.* When an epidemic declines from natural causes, it generally becomes less fatal. Of the four patients attacked on the 26th of August, three died, of whom one was a young, robust epileptic, who lived but five hours after the first symptoms; another was a strong lunatic, who succumbed in nine hours. The two cases which occurred on the 2d of September, after the suspension of the use of the acid, both died, thus showing that the type was none the less fatal.

How did the sulphuric acid act? According to Dr. G.

B. Wood, it has the following effect upon the system, viz., *tonic*, *astringent*, *refrigerant*, and diuretic. It has been largely used in the treatment of the first and second stages of cholera. Dr. Macnamara, in his work on Asiatic Cholera, recommends the use of dilute sulphuric acid, in doses of fifteen minims, in the second stage. The celebrated "Austrian Specific" was composed of sulphuric and nitric acids. Nitric acid had been used in India in the treatment of cholera with considerable success. It was tried in England and found to be of no avail, when further investigation proved that the nitric acid of India contained a considerable amount of sulphuric acid. The latter was an accidental product of the manufacture of the nitric acid in India. Hence the use of the combination of these two acids in the treatment of cholera. Elixir Hallerii, or liquor acidi Hallerii, has been much used in India, and is ordered as part of the medical stores of the British army there. It consists of sulphuric acid and alcohol. Drs. Buxton, Sansom, and Fuller, of England, used sulphuric acid with success in the first stages of cholera, especially in the choleraic diarrhea. From the above statements it would appear that sulphuric acid itself has some effect upon the disease, and now we will proceed to discuss its influence as a prophylactic.

It had been noticed that workers in copper were remarkably exempt from cholera, and upon investigation it was found that the air surrounding them was considerably charged with sulphuric acid, which gave rise to the supposition that this was the active preventive agent. This led to the use of sulphuric acid in cholera districts and hospitals, but with what results I have not been able to learn.

It has already been stated that sulphuric acid may act beneficially independent of any specific action upon the cholera germ.

I have said that it is a tonic, astringent, refrigerant, and diuretic. The vital energies are often very much reduced, digestion is poor, and the intestines and the system at large are in a relaxed condition, the result of the high temperature of summer. Here we find the condition favorable to an attack of cholera. The tonic, astringent, and refrigerant effects of the sulphuric acid would all be eminently indicated by the conditions, and its administration might tide the patient over the period of danger. It may also act beneficially in another way. We all know the depressing effect of fear, which undoubtedly predisposes to cholera. A prophylactic given in such cases would allay the fear and thus ward off the disease.

It would seem that the article is of more importance since the comparatively recent discovery of the comma-bacillus, which cannot live in an acid medium. May this fact not account for the efficacy of sulphuric acid as a prophylactic? The germ is, perhaps, destroyed in the alimentary canal before the products of its activity are taken up by the system. The remedy is in any case well worth a trial; for, if it should only allay the fears of the timid, the otherwise resulting depression might be avoided.

Diagnosis and Treatment. It is most important to recognize the disease in its earlier stages; for at this period simple treatment is usually attended with success. Later on, in the cold stage, or in that of collapse, about 50 per cent. die, even under the most skilful management of the physician and nurse.

What are the first symptoms of cholera? The *first stage* is the forming stage or *stage of invasion*, sometimes called *cholerine*, or the *diarrheal stage*. The intestines are in an irritable condition. The discharges are at first yellow and fetid; later on becoming whitish or grayish, and being composed of serum and epithelium. Fibrinous flakes are sometimes present and the stools are blood-stained. This is the stage of invasion. It may come on abruptly, or gradually. Death may, in some rare cases, take place without vomiting or diarrhea. I had an opportunity of observing two such cases at the Philadelphia Hospital in 1866. At the autopsy the stomach and intestines were found filled with the so-called "rice-water" material, which usually constitutes the discharge in cholera.

Sometimes the first stage is abruptly ushered in with restlessness, wakefulness, noises in the ears, languor, depression, headache, muscular weakness, and a weak, small pulse.

In the cases of insidious onset the earliest symptom is a mild diarrhea. The stools are at first yellow, afterward watery, copious, and frequent, with abdominal pain, slight tympany, borborygmi and nausea. The extremities, especially the lower, become painfully cramped.

This stage may last several days, or only for a short time, and may escape observation altogether. Prompt measures at this stage may stay the disease; hence the importance of recognizing the earliest symptoms.

Thoughtless persons and children are usually the ones that allow this stage to pass by without attention. Such persons should be carefully watched by those having charge of them.

During an epidemic, any tendency to looseness of the bowels, even if seemingly innocent, should be promptly attended to by sending the patient to bed, and carefully regulating his diet. Chilling draughts should be avoided, and under no circumstances should patients be allowed to rise—a bed-pan being used when the bladder or bowels are to be evacuated.

The prognosis is especially grave when the attack is ushered in abruptly, with great irritability of the stomach and bowels, profuse depression, with painful cramps in the muscles of the legs and abdominal walls.

Dr. A. Herman[1] states that the detection of albumin, cylinders, and epithelium in the urine during the time of the precursory diarrhea is a sure sign that the case is one of cholera; otherwise the diarrhea is of other origin. The discovery of the comma-bacillus in the dejections will afford positive proof.

The treatment for this stage is usually as follows: If the case is tardy in onset, simple remedies are

[1] Allgem. Wien. med. Zeitschr., 1873.

usually efficacious, together with the directions already given as to rest and nursing. A combination of general and local stimulants, local sedatives, astringents, and stomachics has proved of benefit in the majority of cases.

A formula that has heretofore been much used and extolled is the so-called Asiatic tincture:

℞.—Chloroformi . . . . . fʒj.
Camphoræ . . . . . ʒij.
Ft. sol. et adde
Sp. ætheris. co. . . . . fʒij.
Tr. opii
Tr. capsici } . . . āā fʒss.—M.
Ol. caryophylli
S.—From five to fifty drops in water.

The following combination has been recommended by Dr. E. R. Squibb:

℞.—Tr. opii
Tr. camphoræ } . . . āā fʒj.
Tr. capsici
Chloroformi (purified) . . . fʒiij.
Alcoholis (strong) . , q. s. ad fʒi.—M.
S.—A teaspoonful in water.

Dr. Alfred Stillé recommended for the precursory diarrhea a formula containing tincture of catechu, chalk mixture, and a small quantity of laudanum. Chlorodyne has been much used in this stage of the disease. Small doses of brandy with lime-water, frequently repeated, or, better, plain soda-water, sometimes control the vomiting. In this stage opium, with calomel or blue pill, has been recommended by many writers, to stimulate the biliary secretions. For local application, mustard plaster or mustard and chloroform sometimes allay the abdominal pains.

The second, or cold stage, or that of collapse. In this stage the patient is in great danger. The most prominent symptom is the constant discharge of sero-epithelial material from the stomach and bowels. This fluid is of a grayish or whitish color, serous, intermixed with fibrinous flakes, and is usually passed without effort, being sometimes ejected from the bowels and stomach simultaneously. In some cases there is a persistent hiccough and painful cramps in the muscles of the legs, arms, fingers and toes, and abdominal walls. The cramps are often attended with contraction of the extremities. The patient is weak, stupid, heavy; the eyes are dark and sunken; the conjunctivæ are dull, dry, and covered with a film; the tongue is dry and covered with a light, pasty film, and the nose is sharp and pinched.

The breath is icy cold, the respiration shallow, while the voice is husky and whispering. The skin is cold, blue, shrivelled, and bathed in a cold, clammy sweat. The extremities first become cold, and afterward the trunk. The urine is scanty or suppressed. The blood is deprived of its water, thereby becoming greatly decreased in bulk and thickened, so that the poor, weak heart cannot propel it to supply the thirsty and famished tissues. The patient grows weaker and passes into a state of unconsciousness, and death ensues. Treatment at this stage is usually followed by little apparent benefit.

The skin and mucous membranes are pouring out the fluid from the blood and tissues, so that they are in no condition to absorb medicines brought in contact with them. Medicines injected subcutaneously are scarcely absorbed, for osmosis is reversed. Intravenous and rectal injection of saline fluids has been used with varying results. The bowel would not be likely to absorb and the fluid would probably be rejected. The object of the saline injections is to make good the loss caused by the general leakage from the body. Transfusion of milk has been tried to the same end.

Dr. David B. Smith has proposed the injection into the veins of amyl nitrite, to overcome arterial muscular spasm. He injected into the veins of a patient two drams in thirty-five minutes without appreciable benefit.

A physician in India has recently published his experience with corrosive sublimate, which he employed in doses of $\frac{1}{100}$ grain.

Artificial heat and cutaneous stimulants have been used over and over again, with but little effect. If the patient survives the second stage, reaction slowly takes place. The treatment of the second stage is eminently unsatisfactory. The ability of the patient to tide over the crisis seems of more importance than the administration of medicaments.

The third stage, or stage of reaction, or stage of secondary fever. The conditions demanding treatment are extreme prostration, fever, and an alimentary canal deprived of its epithelium. The secretory activity of the kidneys is greatly impaired. The condition is decidedly typhoid. The plan of treatment will be expectant. One important point to be borne in mind is that the stomach and bowels will tolerate but little nourishment, for even after the patient has been convalescing for days a slight error in diet may induce a relapse.

I append a list of the medicines that have been employed in the treatment of cholera—

Mercury—Calomel, blue pill, and corrosive sublimate in small and frequently repeated doses. The first two are often combined with opium. These are given for the purpose of quieting the stomach and stimulating the natural secretions.

Tincture of camphor—Used as a systemic as well as a local sedative.

Tincture of capsicum—A stomachic and stimulant to the gastro-intestinal canal.

Opium.—Tincture and deodorized tincture as local and general sedatives. To be given in small doses. Morphine has been used hypodermatically.

Chloroform—Both as a stimulant and sedative, to allay gastric irritability.

Sulphuric Acid—A tonic, refrigerant, and astringent to the gastro-intestinal mucous membrane (and a germicide).

Nitric Acid has been employed by itself and in the form of Hope's mixture, a combination with tincture of opium and camphor-water.

Creasote—As an antiseptic, as well as to allay irritability of the gastro-intestinal mucous membrane.

Brandy is the favorite alcoholic remedy, used early in small doses, in combination with lime-water or plain soda-water. Champagne has been largely used to allay gastric irritability.

Turpentine has been administered as a stimulant.

Atropine acts as a stimulant to the respiratory and cardiac centers and diminishes secretion.

Amyl Nitrite has been tried in the hope that it would dilate the arterioles and subdue muscular spasm.

Arsenic has been extensively used to check the vomiting, small doses being used.

Phosphorus, copper salts, lead salts, strychnine, have also been administered.

22 S. EIGHTEENTH STREET.

CHOLERA AND ITS MIGRATIONS.

BY HENRY HARTSHORNE, M.D.,
OF PHILADELPHIA.

THE extreme public alarm existing in this country concerning cholera, and the action of municipal and national authorities in their endeavor to exclude it, have caused immense commercial losses and great inconvenience, indeed distress, to individuals and families. It seems important, therefore, that well-defined and well-sustained opinions on the subject should be held by physicians and sanitarians, to whom the people naturally and properly look for advice.

The intervals, often of a number of years, between the widely-prevalent epidemics of cholera, especially in this country, leave opportunity for many of the facts in their history to be practically forgotten. Of physicians now in practice, a large number did not have personal acquaintance with the visitation of 1866; few of them reach back in memory to those of 1849 and 1854. Moreover, the complexity of the subject of the causation of disease, particularly with regard to the questions of personal contagion, local infection, fomites, and atmospheric transmission, accounts for the diversity of opinion even amongst medical men; leaving the conclusions current from time to time often remote from the secure foundations of exact science.

Personal acquaintance, as a practitioner, with cholera in 1849, 1854, and 1866, as well as a good deal of attention to the literature of the subject,[1] makes it pardonable for me to recall at this time some of the facts, and the legitimate, indeed logically necessary, deductions from them, which appear to be now largely lost sight of, even within the medical profession. As astronomy was a science before Schiaparelli, so cholera had a history before Robert Koch. Yet certain ideas are now by many persons taken for granted, which were long ago tried and found wanting; some of them as far back as 1831–32. A few cardinal questions may serve to bring the matter clearly in view.

Is cholera personally contagious? Only one *rationale* of its personal transmission has taken much hold of the minds of the medical profession: that of its being produced by the use of drinking-water infected by the stools of cholera-patients. There is much to sustain the opposition of Pettenkofer and others to this theory; all the facts asserted in its favor being explicable under the wider generalization that, in the presence of the epidemic cause, foul drinking-water is the most effective of all agencies in the propagation of cholera. Since the discovery by Koch of the asserted specificity of the comma-bacillus, the cholera-stool theory, and with it the contagion-idea altogether, has prevailed over everything else; bringing back a *wave* of rage for rigid quarantine, isolation, etc., under which we are now suffering more than ever before in this country. It is satisfactory to read in the editorial columns of THE MEDICAL NEWS (September 3, 1892) an allusion to the "disputed question of the causal relation of the so-called comma-bacillus." The affirmation by T. R. Lewis, Ray Lankester, and others of the identity of that microbe with one commonly found in the intestines, and even in the saliva, has been denied but not disproved.

That the cholera-stool transmission cannot be the exclusive mode of extension of cholera over the world is demonstrated by well-known facts. Look, for instance, at the immense zigzag leaps, or rather flights, taken by the epidemic in its migrations after entering Europe from Asia.

In 1831 cholera was in Warsaw in April; in Hungary from May to September; in St. Petersburg in June; in Moscow in September; in Berlin and Vienna first in August; Hamburg, October 11th, and Sunderland, England, October 26th; but not in Edinburgh and Glasgow until January, nor in London till February, 1832; in Dublin and Paris in March. On our continent, Quebec and Montreal had it in June, and later in the same month New

[1] Cholera: Facts and Conclusions as to its Nature, Prevention, and Treatment. By Henry Hartshorne, A.M., M.D., etc. J. B. Lippincott & Co., Philadelphia, 1866.

York and Albany; Philadelphia in July; Boston and Baltimore in August; by September it was present, with more or less virulence, in twelve States of the Union.

Not proposing to touch upon this history, except for the purpose of exemplification, it may be mentioned that in 1849 the first American cities attacked were: In January, Memphis and St. Louis; in May, Chicago, Buffalo, New York, and Philadelphia; in July, Baltimore had a very remarkably limited epidemic, affecting *one-half of its almshouse building*, the side whose windows overlooked a large and foul cesspool. England and Wales, besides Cologne and other Continental cities, were affected with the epidemic in 1848–49.

In 1865, Arabia and Egypt were severely visited in the spring; Constantinople, in July; then it spread over Europe. In 1866 it was in Egypt in June; thence it traversed Europe, and finally crossed the Atlantic, reaching New York, Philadelphia, and some other cities; it was our last cholera-epidemic. Since that time the most notable cholera-year in Europe has been 1884. Its ravages during that summer were particularly severe in Naples, 1200 deaths resulting from it in that city by the middle of September, and nearly 11,000 altogether in Italy.

The order of succession in the European cities in the present year has been, so far: Moscow, St. Petersburg, Paris, Hamburg, Havre, and Antwerp. How did cholera pass from St. Petersburg to Paris without, so to speak, stopping at stations by the way? Political sympathy, it is true, exists between Russia and France. The Psychical Society might suggest that it was communicated by telepathy; but sanitary science admits no such conception. Neither should it hesitate to recognize that such a transit could not be checked by any quarantine or *cordon militaire*. The latter measure was fully tried in Europe as long ago as 1831–32, with absolute failure; at Vienna, for example.

An *instantia crucis* against the dependence of the migration of cholera upon transmission by the channels of human intercourse occurred in France in 1884. The outbreak at Marseilles and Toulon in June of that year was made the occasion of a scrutinizing investigation. There was then no cholera elsewhere nearer than India. The Chief of the Naval Bureau of Health and the Admiralty Inspector, Rochard, declared officially that the disease was not brought by any vessels from elsewhere.

Dr. Brouardel made a special visit of inquiry to the infected cities. His conclusion, as reported to the Académie de Médecine, was published in a letter from Paris to the *London Times*, July 4, 1884. It was to the effect that the two sailors first taken ill had not been to sea for five years, and had no communication with other vessels; and that the same was true of a person who died of cholera at the Lycée in Marseilles, June 21st, about a week after the two sailors were attacked. Brouardel affirmed decidedly that (notwithstanding a charge made against a vessel from China, all on board of it being well after a voyage of forty-five days) it was impossible for any vessel to have brought the infection to Marseilles and Toulon. Yet 5000 deaths occurred in France, mostly in those two cities, in June, July, and August, 1884.

In the *American Journal of the Medical Sciences*, July, 1873, Dr. E. M. Estrazulas presented important testimony showing that an epidemic of cholera beginning in Paraguay in 1866 and continuing as an endemic for three years, could not have been imported by human intercourse, by ships or otherwise; the peculiar circumstances of the war with Brazil making this impossible.

As to the possibility of the personal contagion of cholera in any other way than through the entrance of the stools into drinking-water, some facts, now generally forgotten, but on record, may be here recalled. Dr. Austin Flint well contrasted cholera, in this respect, with typhus, smallpox, and scarlet fever.[1] In Moscow,[2] in 1831, 587 patients affected with cholera were admitted into a hospital containing 860 patients of other kinds, yet not one of the latter took the disease. Dr. Alison,[3] of Edinburgh, testified that in 1832, and in 1848–9, the dissecting-rooms of his city were almost exclusively supplied with cholera-subjects; but in neither year was there a single case of the disease among the numerous students attending in those rooms. How preposterous, in view of such evidence, seems the assertion by cable, September 3, 1892, that a porter in Berlin was attacked with cholera half an hour after carrying to the disinfecting chamber some linen of a traveller just arrived from Hamburg! If that were so, how could any survive who handled all the linen and put it into the chambers for disinfection?

Dr. Foy[4] and ten others in Warsaw, in 1831, inoculated themselves with the blood of cholera-patients, tasted their dejections, and inhaled their breaths, without taking the disease. Similar experiments were performed, with the same negative result, by surgeons and medical students at Moscow and Dantzic in 1832, and afterward by Lizars, Coste, Schmidt, Meyer, Marshall, and others. Dr. Houston in the *Richmond Medical Journal*, in 1866, stated that a man in Wheeling, Va., lay all night in the clothes of another who had just died of cholera, without evil consequences. How unreasonable, then, is the *panic* that leads some persons

[1] Practice of Medicine, p. 425.
[2] Brigham: History of Cholera, p. 324.
[3] British and Foreign Med.-chirurg. Rev., Jan. 1854, p. 22.
[4] Gazette Médicale, 1831.

to be afraid, almost or quite, of the shadow of anyone who has been near a place, or a vessel, infected with cholera. We read the following in a recent cable despatch from Europe:

"Hamburgers are treated like lepers elsewhere in Germany. Hotel-doors are shut in their faces, and it is impossible for them to obtain lodgings. Many of them have been known to alight from the railroad trains a few stations before reaching Berlin, and to come into the city by local trains, in order to avoid inspection. The authorities are endeavoring to stop this practice, but find it difficult to do so."

Let us hope that no such inhumanity will throw discredit upon civilization in this country.

Some other facts in the history of cholera, strangely ignored by many, need to be here recalled. In 1848 two emigrant ships, the *New York* and *Swanton*, left Havre at a time when there was no cholera there, the former going to New York and the latter to New Orleans. Both were attacked by cholera during the voyage; one when sixteen and the other when twenty-seven days out at sea.[1] If there had been cholera at Havre when they started no chance of so long a time of incubation for the disease could possibly be allowed by any, either of the older or of the more recent authorities.

In 1854, two of the Copes' line of packets, sailing from Liverpool for Philadelphia, at a time when there was no cholera in the former city, were attacked by cholera when many days, one of them, the *Tonawanda*, two weeks, out at sea. The latter vessel, after the disease had continued for several days, neared a large iceberg, which reduced the temperature of the air 30°. On the day before the iceberg was met the largest number of cases occurred; after that, no new one at all; the morbific cause appeared to have been frozen out. In April, 1866, two steamers, the *England* and the *Virginia*, left Liverpool, the former for Halifax and the latter for New York. One had on board 1202 passengers, chiefly emigrants; the other 1043, of whom 1029 were in the steerage. There was no cholera in Liverpool at that time; but both vessels were attacked, one five days and the other seven days from port. In all of these instances now mentioned, the only rational explanation is that the epidemic cause *passed over the ocean through the atmosphere*, independently of human conveyance.

On account of this manner of migration I propose a new term as applicable to epidemic cholera. It is *autoplanatic* (from αὐτός, self, and πλανάω, to wander); that is, wandering under causal conditions peculiar to itself, as distinguished from the conveyance of smallpox, scarlet fever, measles, etc., only through human intercourse.

In view of the facts alluded to, and others also which are particularly familiar to those who have resided in British India, it is not strange that many of those most fully and closely acquainted with cholera are convinced of the uselessness of personal quarantine as a measure for its exclusion anywhere. That view of it has been emphatically affirmed by such eminent authorities as Gavin Milroy and Sir Joseph Fayrer, in England; Stewart Clark, Payne, Bryden, and Cunningham (after thirty-three years' residence), in India; Cazalas, in France; Pettenkofer, in Germany, and Tommasi-Crudelli, in Italy.

On the other hand, *sanitary police* (including, as properly coming under that term, Dr. Joseph Holt's systematic disinfection of infected or suspected vessels) has had signal triumphs, showing that it is entitled to entire confidence for the prevention of cholera, always and everywhere. Notable instances of this might, were space here allowed for it, be narrated as occurring in the arrest of a very destructive epidemic of cholera in 1884, in Genoa,[1] by a change from a bad to a good and pure water-supply for the city; a similar result at Mendoza,[2] in South America, in 1887, following the provision by the government of Buenos Ayres of means for boiling all the drinking-water used by the inhabitants of the infected town; and the eradication of an epidemic occurring for the third time on the island of Takasima, Japan,[3] in 1887, by a thorough system of sanitary improvement, under charge of a company having in its employ a large number of laborers on the island.

Shortening the time of detention at quarantine to three, four, or five days, sufficient for thorough disinfection of all suspected *fomites*, is a most beneficial improvement on the old time forty days' imprisonment on board or at a Lazaretto. This is in the direction of scientific as well as humane progress. There is room for further progress in the same direction. It is within the power of the medical profession at the present time to render a great service to commerce, as well as to philanthropy, by urging the immense advantage of thorough sanitary police over any and all measures of quarantine, in the certain and perpetual prevention of epidemic cholera.

Port Physician.—Dr. Henry Leffmann has resigned the position of physician to the Port of Philadelphia, and Dr. E. O. Shakespeare has been appointed by Governor Pattison as his successor.

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[1] Dr. James Wynne, Report of Cholera in the United States; and Dr. Gavin Milroy, British and Foreign Medico-chirurgical Review, October, 1865.

[1] Philadelphia Times, October 6, 1884.
[2] Public Ledger, Philadelphia, 1887.
[3] Sanitary News, March 26, 1887.

RESULTS OF THE EMPLOYMENT OF TUBERCULIN AND ITS MODIFICATIONS AT THE ADIRONDACK COTTAGE SANITARIUM.[1]

BY E. L. TRUDEAU, M.D.,
OF SARANAC LAKE, N. Y.

THE principal interest that attaches to the cases to which I am about to draw attention lies in the fact that both the main factors concerned in the causation and development of tuberculosis were treated at the same time — a change of climate, a systematic, restful open-air life, feeding, and hygiene being invoked to efface that nutritive vice which constitutes susceptibility, while at the same time a method said to exercise a specific curative influence upon the existing pathologic processes was regularly applied.

We must usually content ourselves with placing our patients amid the most favorable environment attainable, the beneficial influence of which is primarily aimed at the existing malnutrition, and secondarily at the diseased processes; but even if we succeed in arresting the progress of the malady by these means, and in improving nutrition, the patient still carries for a long time an infectious, though dormant element, ready, like a smouldering fire, to break out, and sooner or later, again overcome the newly-acquired resistance. The ideal plan of treatment in tuberculosis would, therefore, be one that would enable us, while improving our patient's general condition, to stamp out this infectious element within his tissues, and thus obtain a more permanent cure. Koch's method, perhaps more than any of the many hitherto proposed, gave promise of doing this, and, although its extravagant claims have not been sustained by experience, and it has fallen into general disuse, some investigators, prominent among whom may be mentioned Klebs and Hunter, have clung to the belief that tuberculin contains a remedial element; that many of its injurious substances may be eliminated, and that even if the exaggerated specific virtues claimed for it cannot be verified by experience, we may, by following Koch's suggestion, ultimately obtain a product free from the dangers of tuberculin, yet capable of instituting in tubercle reparative changes of greater or less degree, leading to cure. I have sought, by a brief study of these cases, to obtain a certain amount of evidence as to the efficacy and dangers of Koch's tuberculin when exhibited to patients living under the most favorable surroundings attainable, and also as to the relative curative value and dangers of the modifications proposed by Hunter.

Are we in the future to cast these bacterial products aside and rely entirely on favorable environment alone? and are our efforts to be directed solely to improving nutrition, as in the past, or may we yet hope that with an enlarged knowledge of these complex products and their effects, a substance may yet be produced, free from danger to the patient and capable of staying, to a greater or less degree, the ravages of a disease against which our best-directed efforts are at present too often of no avail?

Treatment with Koch's Tuberculin.

For the sake of brevity, only the main features of the cases treated with tuberculin and the results obtained will be stated. Thirteen patients were treated at the Sanitarium with Koch's tuberculin for an average period of eleven months. The longest treatment was carried on for eighteen months; the shortest for four. The injections were discontinued for about six weeks at intervals of from two to three months; the doses employed were usually small; constitutional disturbance, as indicated by a temperature above 100° F., being avoided if possible. As the doses became large, the intervals between the injections were lengthened.

Diminished susceptibility to tuberculin was observed in most patients, as the result of previous treatment. At whatever stage of the disease they were classed, the cases were selected as presenting some favorable features, though all showed the rational and physical signs of pulmonary tuberculosis, and their expectoration contained bacilli. Six were classed as incipient, four as advanced, and three as far advanced. The results were three apparently cured; in three the disease was arrested; three were improved, and four steadily failed. Of the six incipient cases, three were apparently cured; two had their disease arrested, and one was improved. Of the four advanced cases, two were finally classed as arrested, and two failed. Of the three far-advanced cases, two were improved and one failed. The average gain in weight for nine patients was thirteen and one-quarter pounds; the average loss for three patients, three and three-quarter pounds. The complications were tuberculous inflammation of the ankle-joint once; fistula-in-ano once; hemoptysis twice; inflamed non-suppurating cervical glands once, and fresh pulmonary involvement twice.

These results, even in selected cases, are, on the whole, but little better than are usually obtained by the climatic and out-of-door plan alone. They illustrate, however, that in cases in which the nutrition is constantly maintained at a high standard, more can be expected of tuberculin than in those in which the reverse holds good. The improvement that almost invariably follows the injections in apyretic cases, and is so encouraging to patient and

[1] Read at the Ninth Annual Meeting of the American Climatological Association, held at Richfield Springs, June 23, 24, and 25, 1892.

physician, does not seem to be continuous, but ceases before a cure is effected. The dangers incident to the injections are undoubtedly greatly lessened by the use at first of small doses, by close supervision of the invalid's habits, and by good climatic and hygienic surroundings. They are, nevertheless, real, and some of the complications seem to have resulted from the treatment. Nevertheless, my impression was that in many cases, for a time at least, a distinct and specifically beneficial effect was produced, not so much on the general condition of the patient as on the malady itself; unfortunately, the cases most suitable for this treatment are precisely those in which recovery may be hoped for under the more tedious but much safer climatic and out-of-door plan, but in at least some of these under observation the cure was apparently hastened by the injections. Koch's method is certainly the first proposed that, judged by the physical signs, can produce a specific impression on tubercle, even though this impression may, without any apparent reason, often ultimately tend to an aggravation rather than a cure of the disease. Its uncertainty in this respect is its greatest drawback, and is no doubt due to its being a mixture of good and evil, a combination of many elements, both remedial and injurious, as yet but little studied or understood. In acute cases, with high fever, it has seemed but to hasten the inevitable end. Even in its crude state, it has undoubtedly a really beneficial influence, and in the apyretic types it is, in skilled hands, capable of inciting reparative processes in tuberculous tissues, and of even turning the tide in favor of an ultimate arrest or cure of the disease. Its uncertainty of action and its very evident dangers have seemed to me, however, to outweigh its curative influence, and, until further research has opened the way to safer treatment by this method, our sole dependence must still be placed on a favorable environment, and our best efforts continue to be directed to a thorough application of all measures that improve nutrition.

The names of Klebs and Hunter are most prominently associated with the idea of eliminating from tuberculin some of its dangerous elements, while retaining its curative ones. Klebs has seen fit to surround his work with the mystery that has hovered over this product from its discovery, and has given no exact data that would as yet enable others to produce his tuberculocidin or test his conclusions. Hunter, on the other hand, has given his methods in such clear and concise terms that no difficulty is experienced by the bacteriologist in preparing the substance he recommends. As a result of his researches, he has proposed two modifications of Koch's tuberculin, designated as B and CB, both of which bring about in lupus certain reparative changes, tending to cure, but unaccompanied by fever, and each varying greatly in the character and intensity of the local reaction it produces. Following Hunter's directions explicity, I found no difficulty in preparing in my laboratory from tuberculin the modifications he has proposed, and a set of experiments in animals to test their relative value and dangers was at once undertaken. The results have been given in a paper[1] read recently before the Association of American Physicians, the conclusions reached being first, that CB contains much less of the remedial element than tuberculin, and is apparently quite as dangerous; second, that modification B is as efficacious as tuberculin, and free from some of its dangers. In view of this evidence the use of CB was discontinued at the Sanitarium, and modification B alone tested.

Treatment with Hunter's Modification B.

Ten patients were treated at the Sanitarium with injections of this substance, the longest period during which the treatment was continuously administered being six months; the shortest three weeks, the average about five months. Four cases were classed as incipient, three as advanced, and three as far advanced. Though these patients were all selected for some favorable feature in their malady, they all had pulmonary tuberculosis and bacilli in their expectoration. The results were four apparently cured, the bacillus having disappeared from the expectoration of all, though one still showed in his scanty sputum a few elastic fibers. All of these were incipient cases. Of the three advanced cases the disease was arrested in one; one was improved; one was unimproved. In the three far advanced, one was improved and two were unimproved. The average gain for eight patients was six and three-quarter pounds; the loss for two patients five and one-half pounds. The complications were fistula-in-ano once, and once a prostatic swelling that disappeared without suppurating. No new areas of disease were developed in the lungs, though it undoubtedly progressed in those who remained unimproved by the treatment.

These results, though limited to so few cases, are certainly encouraging, and are better than are usually obtained by climatic and hygienic treatment alone; and the disappearance of the bacillus, even though it should prove to be temporary, is a fact of some significance. The gain in weight was not as marked as might have been expected, but may, in a measure, be explained by the comparatively short duration of the treatment. The modified tuberculin was first given in doses of 0.3 gram daily, and slowly and steadily increased as long as no rise of temperature occurred. It was carried finally to 0.7 or 0.8 gram. No general reaction at all took place in

[1] THE MEDICAL NEWS, September 3, 1892.

apyretic cases, and the local reaction was less marked than that which occurred after injections of tuberculin. The latter was nevertheless very perceptible, and the changes brought about in the diseased areas were the same as occur more slowly during the spontaneous arrest and cure of tuberculous lesions by natural methods. In two of the feverish cases, nothing but an apparent aggravation of all of the symptoms resulted from the injections, and these were promptly discontinued. In the two others the temperature gradually fell and marked improvement occurred. To anyone familiar with the irregular course and relapsing nature of pulmonary tuberculosis it is quite evident that no conclusion of value as to any special treatment for this disease can be reached in a few months, but as far as such a limited experience can prove anything, I have been favorably impressed with the freedom from ordinary complications and with the excellent results produced in so short a time by injections of this modified tuberculin. More extended research and clearer knowledge of the various elements, both beneficial and injurious, contained in bacterial products, as well as of their effects upon tuberculous animals, may in the future lead to still further improvement in this as yet tentative method of treatment. Specific medication, to whatever degree of perfection it may yet attain, will necessarily best be applied in conjunction with climatic and hygienic measures. At present its limitation to early and nearly apyretic cases seems indicated.

Hunter and Klebs have confined their labors entirely to the products of the tubercle-bacillus as found in Koch's tuberculin, and Hunter has apparently been partially successful in already obtaining an improved substance that causes much less fever and is evidently much less likely to bring about an aggravation of the disease and dangerous complications. Kinnicutt's experience in the wards of St. Luke's Hospital, and my own observations bearing both on the climatic aspect of the question and on experimental tuberculosis in the laboratory, are in accord thus far and point to the advantages of Hunter's modification B over crude tuberculin. In view, however, of the very evident limitations of our chemical knowledge of the true nature of bacterial products it has seemed to me that the facts already gained by a chemical study of the subject might be supplemented by further animal experimentation with pure cultures, as they can be grown by any bacteriologist, and that some of the mystery that has so long clung to these products might, in a measure, be dissipated by determining, first, whether liquid cultures of the tubercle-bacillus contain a remedial element of sufficient efficacy to cure tuberculosis anywhere and in any animal; second, whether this substance is to be found in the bacilli themselves or in the culture-medium in which they have developed. In the paper already referred to, evidence has been offered showing, first, that liquid cultures contain a remedial substance with which I have been able to cure inoculation-tuberculosis in the rabbit's eye; second, that this remedial element is to be found in the beef-broth in which the microbes have been developed; third, that a glycerin-extract of bacilli, freed by washing from the culture-medium that clings to them, tends, in animals, to favor rather than retard the spread of the disease. These facts are significant and encouraging; they indicate the need of further research, and that we may entertain a reasonable hope that a substance which may prove of decided remedial value in human tuberculosis may yet be obtained from the various products formed in artificial culture-media by the growth of the tubercle-bacillus, and it would seem that, if Koch's suggestion has been called a "shot in the dark," it was, nevertheless, well directed by a skilful hand, and needs, perhaps, but the light which further research may yet bring to make it effectual.

MEDICAL PROGRESS.

Vasomotor Ataxia.—COHEN (*Polyclinic*, vol. 1, No. 2, p. 85) expresses the view that a group of affections, including exophthalmic goiter, local syncope, local asphyxia, symmetrical gangrene, angio-neurotic edema, urticaria, some forms of asthma, perhaps myxedema and other rare and curious affections characterized by hypertrophy or atrophy of the thyroid gland, may be comprehended in the generic designation of vasomotor ataxia. These affections present in common phenomena dependent upon vascular contraction or relaxation. In many of these conditions blood may be found in the urine, sometimes in large quantities, at other times detectable only by microscopic examination; or there may be subcutaneous extravasations of blood, or hemorrhages may take place from mucous surfaces.

Artificial Immunity to Cholera.—To determine if the removal of the virulence of cholera-bacilli treated with an extract of the thymus gland, with preservation of the power of conferring immunity, depended upon the exposure to heat in the process of preparation or upon the action solely of the thymus extract, BRIEGER and WASSERMANN (*Deutsche medicin. Wochenschr.*, No. 31, p. 701) added scrapings from agar cultures of cholera-bacilli to the thymus extract, which they placed upon ice for several days, and with the product they were likewise able to confer immunity.

Protracted Labor and a Fourteen-pound Infant.—HARRIS (*Lancet*, No. 3596, p. 256) has reported the case of a sextipara, in which pregnancy was estimated to have lasted for three hundred and twenty-five days, a still-born female child, weighing fourteen pounds and measuring twenty-seven inches in length, being delivered. The woman had previously borne two other children weighing more than twelve pounds each.

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SATURDAY, SEPTEMBER 10, 1892.

CHOLERA.

THE cholera is at our doors. The duty of the hour is to see that it does not gain entrance. Rigorous measures have been taken to prevent an invasion; and the timely and energetic action of the national, State, and municipal authorities is deserving of the warmest commendation. The coöperation of our Canadian neighbors, also, must be received with much satisfaction, as without it we should be exposed to a risk that it would be difficult entirely to remove.

The battle is, however, by no means won. The enemy has but been repulsed. His ways are most devious and insidious; and he will surely pass the lines if vigilance be for a moment or in a degree relaxed. So many influences are at work that the health and civic authorities must be on their guard lest they be moved by sentimental or specious motives to deviate an iota from their position of rigid exclusion. The carriers of the disease-poison must be kept out, be they persons or apparel or baggage or freight.

Great pecuniary loss may be entailed upon commerce by the necessary measures to be adopted, but a community or a nation must protect the lives of its inhabitants at any sacrifice. Nor can the quarantine restrictions be withdrawn until for some time after the danger of disease-importation has subsided; and with the withdrawal of the more rigid restrictions must come a careful scrutiny that not an isolated case enter and be the possible focus of an epidemic, the limits of which might exceed conception—for the danger is not confined to the present. If it were, there need be little occasion for alarm—for the low temperature of winter would soon bring an epidemic at this season to an end. The greater danger lies in the locking up of the germ-cause of the disease, under favorable conditions of warmth and moisture, in clothing and baggage, to be set free at some opportune moment at a later day, to inaugurate a work of incalculable devastation.

The best treatment of cholera, as of all diseases, and from which the most certain results can be expected, consists in the prophylaxis. With the cause of the disease known and avoidable, cholera becomes a preventable disease.

At other parts of THE NEWS will be found indicated by competent authorities the means and measures to be adopted in the treatment of the various phases of an epidemic of cholera, while the masterly paper of SHAKESPEARE must carry with it the conviction of profound insight.

There can be no question that the regulation of quarantine and of all that pertains thereto should be under the control of the central Government, so that in times of need adequate and uniform measures of protection may be speedily adopted and put into systematic, active operation. Under existing conditions, carelessness or ignorance or parsimony on the part of any marine port may render nugatory the salutary effect of the greatest vigilance on the part of all other ports.

The impending danger will not have been without fruit if it shall lead to legislation centralizing and strengthening the hygienic arm of the Government, and clearly defining and liberally extending the powers of those to whom is entrusted the responsible duty of protecting sixty-five millions of people from the inroads of foreign disease.

What applies to the body politic holds for the individual. The keynote of health is prophylaxis. Each person in a community must consider himself the conservator of the public welfare. It becomes the duty of the physician in especial, particularly in times of epidemics, to impress upon his clients the necessity for the observance of the strictest precautions and the early treatment of what would ordinarily be considered slight ailments.

Let us realize the danger of an invasion of cholera; let us strengthen our protective fortifications; let us render the soil unsuitable for successful implantation; and let us be prepared to root out the evil should it make its appearance in our midst; but, above all, let us not create unnecessary alarm.

LOCAL QUARANTINE FACILITIES.

IF the impending danger of cholera serves to awaken a reasonable interest on the part of the citizens of Pennsylvania in the unsatisfactory nature of the local quarantine arrangements, it will not be an unmixed evil. While the Board of Health is to be commended for the efforts it has promptly made to provide for the emergency, it must be admitted that the putting of new wine into old bottles is but a poor policy.

The present quarantine station for the port of Philadelphia was established about the beginning of this century, largely under the fear of yellow fever, which at that period visited northern ports almost every summer. The arrangements, regulations, etc., were adapted to an age when steam and telegraphs were unknown. In the lapse of a century the facilities of the station have become inadequate and unsatisfactory It is now out of the ship-channel and in the center of a growing population. Residences and places of resort adjoin its bounds. The average draft of water at its landings is so small that most vessels cannot approach within hundreds of yards, and all transfers of passengers and baggage must be made by lighters.

Efficient quarantine of the present day requires facilities for rapidly and safely discharging vessels of heavy draft and for housing and treating passengers. To compel a large number of persons to remain in the steerage of steamers is to invite extension of disease, and is, in fact, a sanitary crime.

The detention of passengers involves the absolute prevention of escape, which can only be secured by their transfer to an island or hospital-ship. Such isolation is also essential for the prevention of the spread of infection, for a location on the mainland can never be wholly disconnected from the surrounding territory, and escapes or unauthorized exits or entrances may easily occur.

The Delaware River presents several points at which such island-quarantine could be located. The best sites are rather far down, but there is considerable advantage in having such a station so far from the city proper that visits to it are rather difficult.

An important feature which is lacking in the present station is the separation of the general administrative departments from the places in which diseased or suspected persons are housed. A combination of the two departments is highly objectionable. A large portion of the work of a quarantine officer is routine inspection, and there is no propriety in locating his office and the quarters of his subordinates on the same territory with the house of detention and hospital. Any convenient place along the shore where the ship-channel approaches within a reasonable distance and affords space for temporary anchorage will suffice for the location of all buildings not required for the detention or treatment of the sick or suspected.

The island station need not be located close to the administrative station. Vessels ordered to discharge passengers, sick or well, can proceed without difficulty some miles up or down the river and return to convenient anchorage when such discharge is accomplished. Discharges of cargo in quarantine can be made in lighters, if necessary.

THE TREATMENT OF TYPHOID FEVER.

UNFORTUNATELY, the treatment of typhoid fever is a subject of never-ending interest. When we consider that typhoid fever is, in every sense of the term, *preventable*, the word "lamentable" scarcely seems adequate to describe the condition of affairs permitting its prevalence. When, again, we think of the interest aroused by the doubtful reports of cures by Pasteurism of an affection so rare as hydrophobia is in Philadelphia, it does seem strange that the constant and unanimous testimony of physicians concerning the causation of typhoid fever in this city should so long fall upon unheeding ears.

If one were to compute only the annual money-value of the lives lost, the time subtracted from labor, the interruption to business, and the expense incidental to a prolonged sickness requiring assiduous nursing, more or less drug-shop stuff, and skilled medical attendance, the sum-total would be found to represent the interest upon a capital more than sufficient to provide the pure water and efficient drainage, to the absence of which the undue prevalence of typhoid fever in the city of Philadelphia must be ascribed.

As yet there is no specific treatment for typhoid fever. Possibly there may be discovered in the

blood-serum of convalescents an anti-typho-toxine. Until then the treatment must be one of rational empiricism. While it is true that in the majority of cases an "armed expectancy" seems justifiable, yet there is a large number of cases in which death must occur unless there be active interference with the progress of the disease. Such interference best takes the shape of systematic cold-bathing.

There is no longer any room to doubt the correctness of the claim made by BRAND and his followers that the disappointments and failures experienced by various observers are due to their departure from BRAND'S method. The patient must be bathed systematically—that is to say, every third hour so long as the temperature manifests a tendency to exceed 102.2° F. (according to BARUCH, 103° F. in the rectum). The bathing must be bathing—*i. e.* "tubbing"—and not something else. The entire body, except the head, must be immersed in water which about three-fourths fills a tub sufficiently long, sufficiently broad, and sufficiently deep for its purpose.

The cold water must be cold and not hot. If at first it is necessary to introduce the patient into a bath of a temperature above 65° F., it should nevertheless be rapidly reduced to that figure, and after the first two or three applications, it should be 65° F. at the time the patient enters it. An air-cushion may be suspended over the head of the tub, as a pillow, and a water-cushion ring be used to support the nates. Before being placed in the tub, the patient's face should be sponged with ice-water, and while in the tub cold affusions to the head and shoulders should be kept up. The entire body, except the lower half of the abdomen, must be subjected to friction during the time the patient remains in the water.

After coming from the bath, he should be received in a linen sheet resting upon a warm blanket and hot bottles should be applied to the feet. The sheet is brought around the body, and, in order to prevent contact of wet cutaneous surfaces, is tucked in between the lower extremities and between the body and the arms. Over this the blanket is wrapped. If the temperature has been over 103° F., the patient remains in the sheet for five or six minutes. Otherwise he is immediately dried with the sheet and then with soft towels. Sleep usually follows the bath.

A little alcohol, preferably as red wine, should be given just before and just after bathing.

No medicine should be given during the treatment, except when urgently indicated for a definite purpose, such as emptying the bowels or keeping up the elimination of urine. The diet should of course be simple, unirritating, and nourishing, milk being preferable to anything else. Many of Brand's followers, however, both in Europe and America, give semi-solid food. Indeed, the ability to digest such food is claimed as one of the good effects of the bathing.

For private patients or for hospital patients this treatment is the best, unless the patient comes under care so late in the second week that the powers of reaction are greatly lowered. Good judgment is then more than ever necessary, and as a rule graduated baths and packs are to be substituted. So, too, some patients, even among those seen early, do not react well, and the method must be modified accordingly. With increasing experience the exceptional cases become fewer.

The results obtained at the German Hospital of Philadelphia for many years by J. SOLIS-COHEN, who bathed only the more severe cases, and more recently at the same hospital by J. C. WILSON, TRAU, and WOLFF, who followed Brand more closely, and the results obtained by S. BARUCH in the Mount Sinai Hospital, of New York, are absolutely convincing that the same success can be obtained in America as in Germany, by equally consistent and resolute practice.

Antipyretic drugs, and especially those of the coal-tar series, should never be used in typhoid fever. To this statement there is no exception. They reduce the temperature at the expense of the recuperative powers of the patient, and when they do not kill, they delay recovery by their interference with metabolism and with excretion. As we have again and again pointed out, cold bathing is not only antithermic but antifebrile, and it is synergistic with the natural processes of recovery. It exerts a notable influence upon nervous disturbances. This was especially marked in a case recently under observation at the Philadelphia Hospital. Not only did wild delirium almost instantly cease when the patient was placed in the tub, but, although delirium returned in a mild form, yet whenever the patient reëntered the water his mind became clear and remained clear during the bath and for nearly an hour afterward. On being asked how he felt, he replied, "I feel good when I'm in the bath." This, too, was a case that came under observation

in the second week, and concerning the outcome of which a dubious prognosis had seemed necessary.

When for any reason cold-bathing is impossible, frequent cold sponging, ice-rubbing, the cold wet-pack, cool spraying, binding cold cloths upon the wrists, applying ice-bags to the head, chest, abdomen, enemata of ice-water, and various other methods of utilizing cold may be employed as more or less efficient substitutes. They cannot, however, fully replace the bath.

Under these circumstances intestinal antisepsis should be attempted by the judicious use of drugs, such as calomel, beta-naphthol, naphthalin, salol, creasote, guaiacol benzoate, guaiacol salicylate, bismuth salicylate, zinc sulpho-carbolate, and the like. Our preference is for salol and bismuth salicylate, if there be a tendency to diarrhea. When there is constipation calomel is used, together with beta-naphthol or salol.

When the indications for turpentine (dry, glazed, or brown tongue, with tympanites) are present, terpin hydrate is sometimes combined with salol. Turpentine can certainly be used to advantage, as taught by GEORGE B. WOOD and H. C. WOOD, not only in the condition mentioned, which occurs late in the second or early in the third week, but after defervescence, when convalescence is delayed and there persists a diarrhea attributed by G. B. WOOD to ulceration that has failed to heal.

Strychnine is sometimes useful, especially toward the third week, when the heart is becoming enfeebled. Alcohol also finds its place at about this time.

Water must be given to drink freely, and nurses should be specially instructed not to wait for the patient to ask for it. Insomnia and delirium, almost unknown when patients are systematically bathed, may in other cases be treated with opium, bromide, or, if need be, chloral. Hyoscine hydrobromate hypodermatically is sometimes useful.

Of complications, hemorrhage from the bowel is often unnecessarily alarming. The majority of cases recover. In treatment, milk-diet should be temporarily suspended and some such aliment as beef-juice, beef-tea, or peptones, that can be absorbed from the stomach, be administered. Opium, with or without tannic or gallic acid, should be given, to splint the bowel. Turpentine, if tolerated, may be given in comparatively large doses in light emulsion. Cold applications to the abdomen are often useful. If cold bathing has been practised, the bath should be discontinued for a time, in order to fulfil the indication for rest.

Among other conditions demanding suspension or cessation of the cold bath are collapse, pleurisy, pericarditis, severe laryngitis, threatening edema, bedsores, intestinal perforation, and peritonitis. Such complications are, however, rare in cases that are bathed. Albuminuria from infectious nephritis is usually benefited by the diuresis following the bath, and would not furnish a counter-indication, unless it give rise to large effusions or anasarca. Should perforation occur, operation may be thought of. To be successful it must be prompt. The indications, counter-indications, and technique will be discussed in a future article.

EXCISION OF THE MEMBRANA TYMPANI, AND REMOVAL OF THE TWO LARGEST AUDITORY OSSICLES.

THIS operation is performed in two varieties of aural disease, viz., in chronic purulent otitis media and in chronic non-purulent otitis media. The patient must be anesthetized in order to save him pain and keep him still. Illumination of the ear is then best obtained by light from a six-volt electric lamp held by a band on the surgeon's forehead.

What can be accomplished by this operation?

In chronic purulent otitis media, excision of the necrotic membrana and ossicula, and of the granulation-tissue always present in these cases, removes a large quantity of obstructive and septic matter from the drum-space, promotes thereby drainage, and permits more direct and complete antisepsis and asepsis of the suppurating tympanic cavity, thus entirely checking or greatly diminishing the purulent discharge from the ear. This operation also favors a renewal of the muco-periosteum of the wall of the tympanic space when this has become carious, and improves the hearing greatly in some cases, in consequence of the more direct entrance of sound-waves to the stapes in the oval window, brought about by the removal of the mechanical hindrances already named. Furthermore, excision in chronic purulent otitis media, by the removal of septic matter from the upper and back part of the drum-cavity, prevents mastoid necrosis, sinus-thrombosis, and cerebral abscess.

In chronic non-suppurative catarrh of the middle ear, the membrana tympani is thickened and, with the ossicula, is retracted, and sometimes it has become adherent to the promontory. Retraction of

the membrana and the malleus brings about retraction of the incus and stapes, and impaction of the latter in the oval window. In many instances there are evidences of adhesions between the ossicles and the surrounding tympanic walls. This condition in the membrana tympani and ankylotic ossicles causes seventy-five per cent. of all cases of so-called chronic catarrhal deafness, with its frequent attendants of tinnitus aurium and aural vertigo. Very often these symptoms continue unabated even after the most elaborate treatment of the naso-pharynx and Eustachian tube. By the excision of the membrana tympani and the two largest ossicles in such cases of chronic non-suppurative catarrh of the middle ear, the hearing is sometimes improved, especially if there is no restitution of the membrana; but the entire and permanent relief from tinnitus and aural vertigo afforded by the surgical removal of the thickened and retracted membrana and ankylotic ossicula, and the consequent release of the impacted stapes, constitutes one of the most brilliant achievements of modern aural surgery.

REVIEWS.

TRANSACTIONS OF THE EIGHTH ANNUAL MEETING OF THE AMERICAN CLIMATOLOGICAL ASSOCIATION, held at Washington, D. C., September 22, 23, 24 and 25, 1891. 8vo, pp. xvi, 276. Philadelphia: W. B. Saunders, 1892.

ALTHOUGH the freshness of the papers contained in this volume has suffered by the long delay usual to the publication of society proceedings, and by the fact that many of the papers have already been published elsewhere, the collection is an interesting and valuable one. While climate is an element of consideration in most of the papers, it is not so in all. As a matter of fact, the larger number of papers are devoted to consideration of diseases principally involving the air-passages. Out of twenty-nine papers it would be difficult to select some for consideration without tacitly reflecting upon the others, and it would not be possible within the limits of this review to give even the titles of all of the papers. Suffice it to say that the volume as a whole is a representative one that reflects credit upon the body from which it emanates.

TRANSACTIONS OF THE MEDICAL SOCIETY OF THE STATE OF NEW YORK, FOR THE YEAR 1892. 8vo, pp. vii, 540. Published by the Society. Philadelphia: Wm. J. Dornan, 1892.

OF the fifty papers and addresses contained in this volume, fourteen consider purely surgical subjects, while fifteen more consider topics partly gynecologic, partly surgical; four are ophthalmic; seven appertain to general medicine, including therapeutics and pathology; three deal with subjects related to the nervous system; and the remainder consider dermatologic and miscellaneous subjects. There are also obituary notices of deceased members; tables of officers, members, and county societies; rules of eligibility to membership; and an appendix containing laws of New York of interest to the medical profession enacted by the Legislature of 1892.

One will be struck by the large number of papers devoted to surgical subjects. Among these is a notable series that deals with the management of genito-urinary calculus.

Dr. Elsner contributes a report of an interesting case of typhoid fever in which perforation occurred, with adhesive and protective peritonitis, death taking place from intestinal hemorrhage. Dr. Martindale contributes a paper on diphtheria, in which he details the method employed in the treatment of twenty-three cases, of which twenty-two terminated favorably, recovery taking place in from five to twelve days after the treatment was inaugurated. The atmosphere of the sick-room was saturated with the vapors of equal parts of North Carolina tar and spirits of turpentine.

The volume is well and tastefully printed and bound.

THE RETROSPECT OF MEDICINE: A HALF-YEARLY JOURNAL CONTAINING A RETROSPECTIVE VIEW OF EVERY DISCOVERY AND PRACTICAL IMPROVEMENT IN THE MEDICAL SCIENCES. Edited by JAMES BRAITHWAITE, M.D. Lond., Obstetric Physician to the Leeds General Infirmary, etc. Vol. CV. January–June, 1892. Small 8vo, pp. xxii, 436. London: Simpkin, Marshall, Hamilton, Kent & Co., Limited, 1892.

BRAITHWAITE has for fifty years furnished the profession in England and the United States an admirable summary of the best current medical literature. At the time of its first publication perhaps not more than two of our present weekly medical journals were in existence; now there are hundreds, and yet the *Retrospect* still holds its place. To survive against such odds is a severe test of merit.

The present volume maintains the reputation of its predecessors. The majority of the selections are from British writers, but a very fair representation is given to American writers, especially in the departments of surgery and gynecology, while in the Synopsis are to be found articles from German and French sources. Naturally the articles are very unequal in point of merit, but all are good, and taken together supply a large amount of valuable reading-matter.

THE MEDICAL AND DENTAL REGISTER-DIRECTORY AND INTELLIGENCER of Pennsylvania, New Jersey, and Delaware. Pp. 424. Philadelphia: George Keil, 1892.

This book contains lists of the National and State Medical and Dental Associations, with their officers and dates of meetings, of the Medical and Dental Colleges of the United States, Medical and Dental Laws, Hospitals, Homes, etc.; also the lists of Medical and Dental Practitioners, with their school and year of graduation, postoffice addresses, and office hours.

HYDROTHERAPY AT SARATOGA. A TREATISE ON NATURAL MINERAL WATERS. By J. A. IRWIN, M.A. Cambridge, A.M., M.D., Dublin, etc., pp. xv, 270. New York: Cassell Publishing Company, 1892.

THIS little book is devoted to a consideration of the therapeutic utility of mineral waters, and, as its name indicates, with especial reference to Saratoga. It is cleverly written and contains information that may prove both useful and interesting to the professional and the lay reader.

CORRESPONDENCE.

INTESTINAL DISORDERS OF INFANCY.

To the Editor of THE MEDICAL NEWS,

SIR: As intestinal diseases in children are now so common and cause so many deaths, permit me to give my experience in their treatment. Opium and the ordinary astringents I very seldom use, reserving them for the cases in which the discharges are so frequent and watery as to cause immediate danger. Creta preparata I seldom use, on account of its taste, and find that most cases do not need it. I bend my efforts toward restoring the discharges to their normal yellow, and find that in the vast majority of cases the diarrhea ceases of itself. If the milk curdles, if possible, I stop it temporarily or diminish the quantity, using, sometimes, lime-water. For food I prefer barley-water with white of egg and a little salt. I clear out the bowels with a mild laxative the first thing in most cases; then I give the following:

℞.—Pulv. acaciæ	. . . . .	ʒij.
Glycerini	. . . . .	ʒij.—M.
Ft. sol., adde		
Bismuthi subcarb.	. . . . .	ʒj.
Aquæ	. . . . q. s. ad	℥ij.—M.

Sig.—A teaspoonful every 1, 2, or 3 hours, as needed.

This is sufficient for mild cases, and will soon get the passages yellow or brown. The bismuth is, of course, an astringent, but it is far more. It checks the formation of gas, is antiseptic, is tonic to stomach and bowels, and analgesic and alterative. I greatly prefer the subcarbonate, as it is much the lighter, free from grit, and pleasanter.

If the passages are too light-colored, the foregoing is not sufficient. It will then be necessary to add a little mercury in some form—*e. g.*, half a grain or one grain of calomel. In obstinate cases I have often seen this in twenty-four hours cause the passages to become normal. Having been a student at Bellevue, I was long deterred from using mercurials, since that great authority, Professor J. Lewis Smith, was opposed to them. Used for a few hours, I believe that, in some cases, they will do what nothing else will. I prefer calomel, as it is tasteless; gray powder is more likely to cause vomiting. I use no sugar. Ninety-nine babies out of one hundred will take the foregoing readily.

If the passages are green, watery, and foul-smelling, a single small dose of calomel (from ¼ gr. to 1 gr.), with the bismuth mixture later on, will, as a rule, quickly restore the passages to their normal condition. Elixir of vitriol in barley-water is useful for thirst, for hunger, as an astringent, and as a tonic. When the stomach is mainly at fault, I often add pepsin, etc. The hot-water bag is generally sufficient for the pain.

In very bad cases I stop all food, and give a decoction of logwood, with elixir of vitriol, for a number of hours, until the child is better. In cholera infantum I have with success used morphine hypodermatically. I think the acacia very important on account of its local sedative effect on the gastro-intestinal mucous membrane. Hence I use large doses of it.

I have not averaged one death a year for several years. Very respectfully yours,

H. M. HASKELL, M.D.

PALMER, MICH.

A CASE OF ATROPINE-POISONING WITHOUT DILATATION OF THE PUPILS.

To the Editor of THE MEDICAL NEWS,

SIR: I recently had a most unusual experience in the case of a woman who had been delivered of a dead child. On the morning of the second day she complained of great pain in the breasts, due to the secretion of milk. In order to check this secretion a solution of atropine (four grains) in rose water (one ounce) was ordered to be applied on lint to the breasts, and to remain on until the pupils responded or the mouth became parched.

After it had been on for two hours, the nurse made an examination and found the eyes normal. The mouth was somewhat dry, but the patient stated that it had been dry all morning, and that she thought nothing of that.

The woman fell into a quiet sleep, and, the nurse having been called out, she was not wakened.

In about four hours from the time of application, in the midst of a sound sleep, the patient awakened with a feeling of great oppression and difficulty of breathing, tingling and numbness in the fingers and arms, as well as in the toes and legs. The extremities were very cold and sweating profusely. The mouth was in the same condition as before. On the following day the solution was again applied, with a result like that of the previous day. On both occasions the pupils were found to be normal, and the tongue in about the same condition as before the application.

I report this case because I have never heard or read of any case of atropine-poisoning in which the pupils did not respond. Yours truly,

JAS. H. MCCARTNEY, M.D.

CHUNG KING, CHINA.

BELLADONNA PLASTERS FOR MASTITIS.

To the Editor of THE MEDICAL NEWS.

SIR: I wish to call attention to a simple and easy method of arresting threatened abscess of the breast in the case of nursing women. This consists in the application to the inflamed breast of an ordinary belladonna porous plaster. In the two years during which I have employed this means there has not been an instance in which the pain and swelling were not reduced in from one to two hours after the plaster was applied. Of course there is nothing new in the use of belladonna for this purpose; indeed, it is the drug generally first thought of; but the method of application is easier, neater, and

cleaner than the use of an ointment, and safer and more certain than solutions of atropine—at least such has been my experience. A year ago, for instance, in a case of marked mastitis, with active febrile reaction, I used an atropine solution for some hours without apparent effect. Then, as the danger of suppuration was growing imminent, I substituted the belladonna plaster, giving great relief in less than an hour. In this instance, as the baby had died, the plaster was allowed to remain on the breast until the secretion of milk had entirely ceased. In another case, a few weeks after, in which the child lived, I allowed the plaster to remain on just long enough to lessen the hardness and reduce the pain so that the mother could endure to have a breast-pump applied every two hours, until the baby, which for some reason now refused to touch that breast, had changed its mind.

ERNEST B. SANGREE, M.D.
744 SOUTH FIFTEENTH STREET.

NEWS ITEMS.

Sanitary and Preventive Measures.—The Philadelphia Board of Health has issued the following instructions:

Thorough ventilation of dwellings is essential to the health of the occupants. Fresh air is a most important means of promoting and sustaining the healthy action of the body. Personal cleanliness, and cleanliness about dwellings and premises, should be most carefully observed. A source of danger to health is the decomposition of organic matter in and about houses. Cellars, areas, drains, cesspools, should be examined to see that they contain nothing to poison the air. Privy wells should be kept free from garbage and refuse matter of all kinds, and if they have been neglected, immediate attention should be directed to them. Damp cellars are injurious to health. The foul and humid air from them will permeate the house, in spite of every effort to prevent it. A remedy should at once be instituted. It is common habit to throw waste material, especially kitchen garbage, into the gutters and streets, where it decomposes and vitiates the atmosphere. This is an offense alike unjust to ourselves and to our neighbors.

For the prevention of disease, a good nutritious diet and regular habits of life are indispensable; temperance in all things is to be observed; and avoidance of all excesses is strictly insisted upon. Constant vigilance is necessary to guard against the many causes which at this season of the year have a tendency to disturb the stomach and bowels, thereby depressing the nervous system and diminishing the power to resist disease.

CLEANLINESS is the essential preventive of disease. Keep your houses, cellars, yards, vaults, and sinks clean, wherever it can be done. Whitewash the walls of your houses, cellars, fences, outhouses, shops, factories, storehouses, and every other place about your premises where dampness exists, and where mould or mildew forms. It keeps the walls dry, sweet, and clean, and prevents the accumulation of moisture, which promotes putrefaction, through the presence of living organisms, which are thought by many to be a specific cause of disease. Avoid all collection of coal-ashes mixed with kitchen garbage, slops, stagnant water, and other semi-solid or liquid filth, anywhere about your premises.

"Sewers, house-drains, waste-pipes, and water-closets should be frequently *flushed* with water—let on the largest practical volume. Water-closets and house-drains should be *flushed* in this manner every day."

VENTILATION.—Your premises, particularly sleeping apartments and cellars, should be thoroughly ventilated. Ventilation is no less a purifier than is water. It cleanses by oxidizing and drying. Keep your houses open and your windows raised during the day in good weather, that they may have the full benefit of sunlight and a free circulation of pure air. Avoid the possibility of exposure to sudden changes of weather at night. When the weather is cool or rainy, be sure to keep a fire in the house in order to prevent dampness; in sparsely settled neighborhoods, or in the suburbs of the city, have a fire in the house the entire season.

DISINFECTANTS are important. They absorb impure exhalations, prevent decomposition, and destroy noxious gases, but in no instance should they be considered or employed as substitutes for a pure atmosphere obtained by free ventilation. "These are simply aids in restoring and preserving healthful purity, and not substitutes for cleanliness and pure air."

They may be employed in cellars, yards, privies, vaults, sinks, water-closets, sick-rooms, bed-pans, stables, and in other places about your premises, or wherever practicable, when offensive odors are emitted.

Quicklime may be employed as a purifier, to act as a dryer in damp apartments, and upon moist and hurtful effluvia. It may be strewn as dry lime on the earth or placed upon plates, or, better still, in the shape of whitewash upon the walls. In the latter form, the addition of a small quantity of carbolic acid adds to its efficiency.

Charcoal is a powerful oxidizing agent. It may be used as a deodorant and purifier. "The sole condition necessary is the free access of atmospheric air, which the charcoal uses in oxidizing the putrid miasms." It should be freely strewn on the floors of cellars, and all places which may be damp and moldy. It should always be used in a crushed and fresh state.

An excellent deodorizing compound may be made by mixing *one part of peat charcoal, one part of quicklime, and four parts of sand or gravel.*

Sulphate of Iron (*Green Copperas*), *Sulphate of Zinc, and Sulphate of Copper.*—Dissolve one or two pounds of any of these salts in a gallon of water, and use the solution to correct decomposing and offensive matters. *Sulphate of iron* is the cheapest of these substances. Eight or ten pounds of it dissolved in five or six gallons of warm water, with one pint of crude carbolic acid added, makes *the cheapest and one of the best disinfecting fluids for common use* in privies, water-closets, drains, and sewers.

Before the emptying of privies or cess-pools the contents should be disinfected. For effective disinfection a solution of two pounds of *sulphate of iron* (*copperas*) in a gallon of water, or of one pint of liquid *chloride of zinc* in a gallon of water (to each of which two ounces of strong carbolic acid has been added) should be used in the proportion of one pint to each cubic foot of contents. After thorough disinfection a quantity of either of these solutions should be poured down daily to keep the cess-pits in good condition. *Chloride of lime* in the proportion of one pound to a gallon of water may also be used.

DISINFECTION PROPER.—*Fire.* The burning of infectious material, infected clothing, etc., is an effectual way of disposing of it. Articles of little value which have been soiled with infectious material (especially old clothing and bedding) had better be burned.

Heat. Boiling for half an hour will destroy all known disease-germs. This is the cheapest and best way of disinfecting clothing and articles which are not injured by the ordinary operations of the laundry. *Moist heat* (steam) at 230° F. destroys germs of all kinds, even the most resistant spores, in twenty minutes.

Sulphur fumigation is an excellent method of purification. Place the sulphur in an iron dish, supported upon bricks in a wash-tub containing a little water; set it on fire by hot coals or with the aid of a spoonful of alcohol. All doors, windows, and other openings should be closed, and allowed to remain so at least twelve hours; the room should then be opened and well ventilated. Two pounds of sulphur will be required for a room ten feet square (1000 cubic feet of space). The amount should be increased for larger rooms in the same proportion.

Chloride of lime is one of the cheapest and most efficient of disinfectants. For the purpose of correcting offensive matters, and for utensils, sinks, water-closets, drains, bed-pans, etc., it may be mixed with water in the proportion of one pound to one gallon. Infected bed and body linen, towels, etc., which cannot be immediately boiled, may be disinfected by immersion in a solution of chloride of lime in the proportion of two ounces to the gallon of water, and left for four hours.

Corrosive sublimate is a powerful disinfectant, but on account of its *highly poisonous* quality should be used with the greatest care. Dissolve in water in the proportion of two drams to the gallon, and add one dram of permanganate of potash to give color to the solution. Label it carefully—POISON. Use one pint of this solution for the disinfection of each discharge in cholera, typhoid fever, etc., or for vomited matters. Leave in vessel ten or fifteen minutes before throwing into cesspool or water-closet. It will injure lead pipes if used constantly; it should not be placed in metal receptacles.

Carbolic acid is very useful for disinfecting soiled clothing, discharges from the bowels, vomited matters, etc., and for the general purposes of disinfection. A wineglassful (two ounces) of the pure liquid, well mixed with a quart of warm water, may be used in night-vessels, water-closets, sinks, or for wetting a sheet to hang in the doorway of a sick chamber; from half a wineglassful to one quart of warm water, for washing furniture, walls, etc.; two ounces to the gallon of water, for clothing, etc. One pint of strong carbolic acid added to five gallons of warm water should be occasionally poured into sinks and drains leading into sewers. One ounce of the crystals mixed with four pounds of slaked lime forms a good powder for covering over offensive heaps of filth or refuse that it is impossible or unwise to remove. Liquid acid diluted with two thousand times its bulk may be used for street sprinkling. *Carbolic acid soap* may be used for the hands.

"It appears to be characteristic of *cholera*, not only of the disease in its developed and alarming form, but equally of the slightest diarrhea which the epidemic can produce, that *all matters which the patient discharges from his stomach and bowels are infective;* that the patient's power of infecting other persons is represented almost or quite exclusively by those discharges; that they are comparatively non-infective at the moment they are discharged, but afterward, when undergoing decomposition, acquire their maximum infective power; and that if *they be cast away without previous disinfection*, they impart their own infective quality to the excremental matters with which they mingle in filth-sodden earth, or in depositories and conduits of filth, and to the effluvia which those excremental matters evolve; that if the infective material, by leakage or soakage from drains or cesspools, or otherwise, gets access even in the smallest quantity, directly, or through porous soil, *to wells* or other sources of *drinking-water*, it can infect, in the most dangerous manner, very large volumes of water; that the infective influence of the choleraic discharges attaches to whatever bedding, clothing, and like things that have been imbued with them, and renders these things, if not disinfected, capable of spreading the disease."—*Chief Medical Officer of Great Britain.*

PERSONAL DUTIES.—Observe strict cleanliness in your person and clothing. Bathe daily, if you have the convenience. If not, wash freely with cold water every day.

Change your undergarments daily, or as frequently as your circumstances will admit.

Be moral, regular in your habits of life, meals, exercise, and sleep.

Be careful to dress comfortably for the season, avoid the night air as much as possible, and when thus exposed put on an extra garment, and do not go into the night air when in a state of perspiration.

Be careful to avoid the use of alcoholic drinks. Do not suppose that their use will prevent the occurrence of disease. On the other hand, those who indulge in the custom are always fair subjects for disease, and when attacked the intemperate are particularly in a condition to offer feeble resistance.

Live temperately, live regularly, avoid all excesses in eating crude, raw, and indigestible food, especially cabbage, salad, cucumbers, and unripe fruits.

The boiling of milk and all water used for drinking purposes is a necessity.

Partake of well-cooked beef and mutton, rice well boiled, and avoid pastry and laxative fruit.

Take your meals at regular seasons, neither abstaining too long at a time, nor indulging too frequently. An overloaded stomach is as much to be dreaded as an empty one.

Avoid bodily fatigue and mental exhaustion. Lead a calm and quiet life. Let all exciting causes be avoided. If you depress or impair the vital forces, it is prejudicial to health. By excitement or violent exercise you increase the susceptibility of the system to disease.

During the prevalence of cholera, do not neglect even the slightest diarrhea, no matter how painless at first.

Discussion on Cholera.—The subject of cholera will be discussed at the meeting of the County Medical Society, to be held on September 14th. Drs. Shakespeare, Lee, Tyson, Hare, and Coplin are announced as participants in the discussion.